

**IN THE UNITED STATES DISTRICT COURT  
FOR THE WESTERN DISTRICT OF TEXAS  
WACO DIVISION**

IOENGINE, LLC,	)	
	)	
Plaintiff,	)	
	)	
v.	)	C.A. No. 6:21-cv-1296
	)	
ROKU, INC.,	)	
	)	
Defendant.	)	Jury Trial Demanded
	)	

**COMPLAINT FOR PATENT INFRINGEMENT**

1. Plaintiff IOENGINE, LLC (“Plaintiff” or “IOENGINE”), by and through its undersigned counsel, alleges as follows:

**THE PARTIES**

2. IOENGINE is a limited liability company organized and existing under the laws of the State of Delaware, with its principal place of business at 22 Ensign Road, Norwalk, Connecticut 06853.

3. Defendant Roku, Inc. (“Defendant” or “Roku”) is a corporation organized and existing under the laws of the State of Delaware, having a principal place of business at 1155 Coleman Ave., San Jose, California 95110.

4. Defendant’s registered agent in the State of Texas is Corporation Service Company d/b/a CSC - Lawyers Incorporating Service Company, 211 E. 7th Street, Suite 620 Austin, Texas 78701.

## **JURISDICTION AND VENUE**

5. This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. § 100 et seq., including, but not limited to, 35 U.S.C. § 271.

6. This Court has subject matter jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and 1338(a).

7. This Court has personal jurisdiction over Roku. On information and belief, Roku is subject to this Court's personal jurisdiction pursuant to due process and the Texas Long-Arm Statute, due to its (i) doing substantial business in this forum, including committing infringing acts alleged herein in whole or in part in this forum; (ii) maintaining a regular and established place of business in the forum, including at 9606 N. Mopac Expressway, Suite 400, Austin, Texas 78759; and (iii) regularly doing or soliciting business, engaging in other persistent courses of conduct, recruiting Texas residents for employment inside and outside this state, and deriving substantial revenue from infringing goods and services provided to persons in Texas. *See* Tex. Civ. Prac. Rem Code. § 17.042.

8. For example, on information and belief, Roku recently “invest[ed] \$2,152,400.00 to build out 62,884 square feet of new space in Austin” at its 9606 N. Mopac Expressway offices,<sup>1</sup> and on information and belief, as of the filing of this Complaint, Roku is prominently advertising approximately 66 job openings, which include positions in hardware design, marketing, and engineering, and of which approximately 35 are software engineering positions, including senior

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<sup>1</sup> *See* <https://www.intelligence360.news/roku-inc-to-spend-2152400-00-to-occupy-62884-square-feet-of-space-in-austin-texas/>.

engineering positions, in its Texas offices.<sup>2</sup>

9. In addition, Roku has previously been party to at least 18 patent cases in this District, including at least 10 cases where Roku has availed itself of the power and benefits of this Court and forum by raising counterclaims seeking a declaratory judgment of noninfringement and invalidity, including in *AlmondNet, Inc. et al v. Roku, Inc.*, 6-21-cv-00731 (WDTX) (Jul. 15, 2021), *AlmondNet, Inc. v. Roku, Inc.*, 6-21-cv-00876 (WDTX) (Aug. 20, 2021), *Ancora Technologies, Inc. v. Roku, Inc.*, 6-21-cv-00737 (WDTX) (Jul. 16, 2021), *Diatek Licensing LLC v. Roku, Inc.*, 6-21-cv-00777 (WDTX) (Jul. 29, 2021), *ESW Holdings, Inc. v. Roku, Inc.*, 6-19-cv-00044 (WDTX) (Feb. 08, 2019), *Flexiworld Technologies, Inc. v. Roku, Inc.*, 6-20-cv-00819 (WDTX) (Sep. 08, 2020), *Flexiworld Technologies, Inc. v. Roku, Inc.*, 6-21-cv-00680 (WDTX) (Jun. 28, 2021), *Flexiworld Technologies, Inc. v. Roku, Inc.*, 6-21-cv-00767 (WDTX) (Jul. 27, 2021), *Flexiworld Technologies, Inc. v. Roku, Inc.*, 6-21-cv-00882 (WDTX) (Aug. 24, 2021), and *MV3 Partners LLC v. Roku, Inc.*, 6-18-cv-00308 (WDTX) (Oct. 16, 2018). In at least two of these cases Roku pursued its counterclaims to and through trial (*ESW Holdings* and *MV3 Partners*).

10. Roku has sufficient “minimum contacts” with the forum such that exercising personal jurisdiction satisfies the requirements of due process and exercising personal jurisdiction over Roku is consistent with “traditional notions of fair play and substantial justice.” *Int’l Shoe Co. v. Washington*, 326 U.S. 310, 316 (1945); *Breckenridge Pharm., Inc. v. Metabolite Labs., Inc.*, 444 F.3d 1356, 1361 (Fed. Cir. 2006).

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<sup>2</sup> See <https://www.roku.com/jobs/listing?location=Austin%2C%20Texas> (last visited, Dec. 13, 2021).

11. On information and belief, within this state, Roku has offered for sale and sold, and continues to offer for sale and sell, products and services embodying the patented inventions, thereby committing, contributing to, and inducing, and continuing to commit, contribute to, and induce, acts of patent infringement alleged herein.

12. Venue is proper in this District under 28 U.S.C. §§ 1391(b) and (c), and 1400(b) because, among other reasons, Roku regularly transacts or solicits business in this District and has committed at least a portion of the infringing acts at issue in this case from and within this District. On information and belief, Roku has a regular and established place of business in this District at 9606 N. Mopac Expressway, Suite 400, Austin, Texas 78759. On information and belief, Roku recently “invest[ed] \$2,152,400.00 to build out 62,884 square feet of new space in Austin” at its 9606 N. Mopac Expressway offices.<sup>3</sup> In addition, on information and belief, Roku employs a number of persons in this District and derives and has derived substantial revenue from goods and services provided to persons or entities in this District and from infringing acts occurring within this District.

13. For example, Roku’s “Investors” website,<sup>4</sup> provides a list of Roku “Management,” including Roku’s Senior Vice President of Product Engineering and Operations, Scott de Haas.<sup>5</sup> Mr. de Haas “oversees product engineering and operation,”<sup>6</sup> and, on information and belief, is located in Roku’s Texas offices in this District. In addition, Gergely Timar, Senior Director of

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<sup>3</sup> See <https://www.intelligence360.news/roku-inc-to-spend-2152400-00-to-occupy-62884-square-feet-of-space-in-austin-texas/>.

<sup>4</sup> <https://www.roku.com/investor>.

<sup>5</sup> <https://www.roku.com/investor/management>

<sup>6</sup> *Id.*

Engineering at Roku, has previously explained in a sworn declaration that “the majority of engineers in Roku’s Austin, TX office focus on the Roku operating system, hardware, and embedded software development,” *AlmondNet, Inc. v. Roku, Inc.*, 6:21-cv-731-ADA (W.D. Tex. Aug. 13, 2021) D.I. 7-1 (August 5, 2021 Declaration of Gergely Timar), at ¶ 6, which, as described below, are relevant to the acts of infringement alleged in this case.

14. As an additional example, as of the filing of this Complaint, Roku is prominently advertising approximately 66 job openings in its Texas offices in this District, which include positions in hardware design, marketing, and engineering, and of which approximately 35 are software engineering positions, including senior engineering positions.<sup>7</sup>

### **BACKGROUND**

15. This patent infringement suit involves fundamental technology that allows portable electronic devices, used in conjunction with terminals, to support enhanced functionality. For example, the technology at issue allows users to interact with portable devices through an interactive user interface to enable the user to control processing activity on the portable device. Further, the technology at issue allows a user to access data and programs from the portable device and a network server associated with streaming video or audio content, displaying advertisements, or processing payments.

16. The technology at issue was invented by Mr. Scott McNulty, who also founded IOENGINE.

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<sup>7</sup> See <https://www.roku.com/jobs/listing?location=Austin%2C%20Texas> (last visited, Dec. 13, 2021).

### **THE IOENGINE PATENTS-IN-SUIT**

17. On October 15, 2019, the United States Patent and Trademark Office duly and legally issued United States Patent No. 10,447,819 (the “’819 Patent”), entitled “Apparatus, Method and System for a Tunneling Client Access Point” after full and fair examination. The application that led to the ’819 Patent, U.S. Patent Application Ser. No. 15/712,780, was a continuation of U.S. Patent Application Ser. No. 14/721,540, which issued as U.S. Patent No. 9,774,703, which was a continuation of U.S. Patent Application Ser. No. 13/960,514, which issued as U.S. Patent No. 9,059,969, which was a continuation of U.S. Patent Application Ser. No. 12/950,321, which issued as U.S. Patent No. 8,539,047, which was a continuation of U.S. Patent Application Ser. No. 10/807,731, filed on March 23, 2004, which issued as U.S. Patent No. 7,861,006. A true and correct copy of the ’819 Patent is attached hereto as Exhibit A.

18. On April 6, 2021, the United States Patent and Trademark Office duly and legally issued United States Patent No. 10,972,584 (the “’584 Patent”), entitled “Apparatus, Method and System for a Tunneling Client Access Point” after full and fair examination. The application that led to the ’584 Patent, U.S. Patent Application Ser. No. 16/579,169, was a continuation of U.S. Patent Application Ser. No. 15/712/780, which issued as U.S. Patent No. 10,447,819, which was a continuation of U.S. Patent Application Ser. No. 14/721,540, which issued as U.S. Patent No. 9,774,703, which was a continuation of U.S. Patent Application Ser. No. 13/960,514, which issued as U.S. Patent No. 9,059,969, which was a continuation of U.S. Patent Application Ser. No. 12/950,321, which issued as U.S. Patent No. 8,539,047, which was a continuation of U.S. Patent Application Ser. No. 10/807,731, filed on March 23, 2004, which issued as U.S. Patent No. 7,861,006. A true and correct copy of the ’584 Patent is attached hereto as Exhibit B.

19. IOENGINE is the assignee of all right, title, and interest in and to the '819 Patent and the '584 Patent (collectively, the "Patents-in-Suit") and possesses all rights of recovery under the Patents-in-Suit, including the right to recover damages for past infringement.

20. The Patents-in-Suit are valid, enforceable, and unexpired.

### **ROKU'S INFRINGEMENT**

21. IOENGINE repeats, re-alleges, and incorporates by reference the preceding paragraphs as if fully set forth herein.

22. As described below, Roku infringes claims of each of the Patents-in-Suit directly (alone or jointly), by making, using, selling, offering for sale, and importing into the United States certain products and services, and indirectly by contributing to and inducing direct infringement by others, by encouraging and instructing others to make and use such products and services in an infringing manner.

23. More specifically, the infringing products include, but are not limited to, Roku's Streaming Players, for example, Roku Express, Express+, Express 4K, Express 4K+, Premiere, Streaming Stick 4K, Streaming Stick 4K+, Streaming Stick+, Streambar, Streambar Pro, Smart Soundbar, Streaming Stick+ Headphone Edition, Ultra, and Ultra LT (collectively, the "Roku Streaming Players"); the Roku OS, and the Roku graphical user interface used with the Roku Streaming Players;<sup>8</sup> products and systems incorporating the foregoing; and reasonably similar Roku portable products with streaming capabilities that embody the apparatuses or practice the

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<sup>8</sup> See, e.g., <https://www.roku.com/products/players>; <https://www.roku.com/products/roku-premiere>; <https://www.roku.com/products/roku-express-plus>; <https://www.roku.com/products/streaming-stick-plus>; <https://www.walmart.com/ip/onn-Roku-Smart-Soundbar-with-built-in-4K-Streaming-Media-Player/642573197>.

methods claimed by each of the Patents-in-Suit (collectively, the “Roku Infringing Products”). The Roku Infringing Products meet the limitations of at least one claim of each of the Patents-in-Suit literally and/or under the doctrine of equivalents.

24. The Roku Infringing Products include portable device streaming players that are designed to communicate with a communications network that includes a communications network node, such as a Roku server, or a server associated with other streaming video or audio providers.<sup>9</sup>

25. Roku instructs and encourages its customers, end-users, partners (including, but not limited to, developers, advertisers, affiliates, beta testers, and service providers<sup>10</sup>), and other third parties, including in this District, to use the Roku Infringing Products in a manner that infringes at least one claim of each of the Patents-in-Suit, including by providing “an open streaming platform,” on which “Roku welcomes publishers and developers to grow their audience with Roku.”<sup>11</sup> Roku further instructs and encourages the infringing use of the Roku Infringing Products, including in this District, by maintaining a Roku Developers website which offers courses, demonstrations, a knowledge center, and developer tools and forums. *See id.* Roku also instructs and encourages the infringing use of the Roku Infringing Products, including in this District, to present advertisement content through the Roku Advertising Framework, which “is built directly into the Roku SDK” and “enables the seamless integration of video advertising into

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<sup>9</sup> *See, e.g. id.*

<sup>10</sup> *See, e.g.,* <https://developer.roku.com/overview>; <https://advertising.roku.com/>; <https://www.roku.com/about/affiliate>; <https://www.roku.com/betatesting>; <https://www.roku.com/roku-powered>.

<sup>11</sup> <https://developer.roku.com/docs/developer-program/getting-started/roku-dev-prog.md>.



your channels.”<sup>12</sup> Roku additionally instructs and encourages its customers, partners, and other third parties, including in this District, to use the Roku Infringing Products in a manner that infringes at least one claim of each of the Patents-in-Suit by instructing and encouraging its customers, partners, and other third parties, including in this District, to use the Roku Infringing Products to make payments using Roku’s payment platform.<sup>13</sup> Roku’s payment platform “provides ... an end-to-end payment process” that, when “integrat[ed] in[to] a channel, ... can provide simple, streamlined workflows that enable customers to purchase and access content with minimal interaction.”<sup>14</sup> “Once customers add a method of payment to their Roku customer account, they can subscribe to channels, rent movies, and purchase sporting events and pay-per-views all directly on-device with just a few key presses from their Roku remote control.”<sup>15</sup> Roku additionally instructs and encourages its customers, partners, and other third parties, including in this District, to use the Roku Infringing Products in a manner that infringes at least one claim of each of the Patents-in-Suit by instructing and encouraging its customers, partners, and other third parties, including in this District, to use the Roku Infringing Products to stream video and audio from services such as Waco City Cable Channel,<sup>16</sup> Welcome to Waco,<sup>17</sup> 25 News KXXV and

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<sup>12</sup> <https://developer.roku.com/docs/developer-program/advertising/roku-advertising-framework.md>.

<sup>13</sup> *See, e.g.*, <https://developer.roku.com/docs/developer-program/roku-pay/how-roku-pay-works.md>.

<sup>14</sup> *Id.*

<sup>15</sup> *Id.*

<sup>16</sup> <https://channelstore.roku.com/details/85329433f23dfa4f3a65e09f93a2b794/waco-city-cable-channel>.

<sup>17</sup> <https://channelstore.roku.com/details/4f331cf3ab3a49b019315b0bfa68ff2f/welcome-to-waco>.

KRHD,<sup>18</sup> Austin News from KVUE,<sup>19</sup> Austin News & Weather,<sup>20</sup> Austin Public,<sup>21</sup> Concertstream – Austin,<sup>22</sup> and The Roku Channel.<sup>23</sup> Roku advertises that “[t]housands more channels for sports, news, international, and kids programming plus broadcast channels ... [a]nd major music services ... are available.”<sup>24</sup>

**FIRST COUNT FOR RELIEF**  
**(DIRECT INFRINGEMENT OF THE ’819 PATENT)**

26. IOENGINE repeats, re-alleges, and incorporates by reference the preceding paragraphs as if fully set forth herein.

27. The ’819 Patent is presumed valid and Roku has had actual knowledge of the ’819 Patent at least as early as the filing of this Complaint.

28. Roku is not licensed under the ’819 Patent and has no other right or permission to practice the invention embodied therein.

29. On information and belief, Roku has infringed and continues to infringe, directly (alone or jointly), literally, and/or under the doctrine of equivalents, in violation of 35 U.S.C. § 271, one or more claims of the ’819 Patent by performing, without authority, one or more of the following acts: making, having made, using, importing, selling, and offering for sale in the United

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<sup>18</sup> <https://channelstore.roku.com/details/8d7477688c88feb9157425a1905cdb08/25-news-kxxv-and-krhd>.

<sup>19</sup> <https://channelstore.roku.com/details/88f24a75a68aaef441c4b0dee518f2e8/austin-news-from-kvue>.

<sup>20</sup> <https://channelstore.roku.com/details/a96135987069487109a3eb0fd9c5d243/austin-news-and-weather>.

<sup>21</sup> <https://channelstore.roku.com/details/7d9530ac89d22f37f4d9866baba9338e/austin-public>.

<sup>22</sup> <https://channelstore.roku.com/details/037954b0aef8664b318ff977ffd666a9/concertstream-austin>.

<sup>23</sup> <https://therokuchannel.roku.com/>.

<sup>24</sup> *Id.*

States one or more products or services that embody the invention claimed in the '819 Patent, including but not limited to the Roku Infringing Products. Since at least after receiving notice of this Complaint, Roku has knowingly infringed, and continues to infringe, one or more claims of the '819 Patent by making, having made, using, importing, selling, and offering for sale in the United States the Roku Infringing Products, which products constitute a material part of the invention and are not staple articles or commodities of commerce suitable for substantial non-infringing use.

30. The Roku Infringing Products embody the patented invention of the '819 Patent and infringe at least Claim 184 of the '819 Patent.

31. For example, each of the Roku Streaming Players is:

“A portable device configured to communicate with a communications network comprising a communications network node and with a terminal comprising an output component configured to present an interactive user interface comprising at least one user interface element configured to be manipulated by a user to enable control of the portable device, the portable device comprising:

a. a network interface configured to enable the transmission of communications between the portable device and the communications network node, wherein the communications comprise data content transmitted from the communications network node to the portable device;

b. a communications interface configured to enable the transmission of communications between the portable device and the terminal, wherein the communications comprise a data content stream transmitted from the portable device to the terminal;

c. a processor configured to stream data content for presentation by the terminal output component; and

d. a memory having executable program code stored thereon, including:

- i. first program code which, when executed, presents an interactive user interface on the terminal output component, receives a command resulting from user manipulation of a user interface element of the interactive user interface, and causes a communication to the portable device processor in response to the command resulting from user manipulation of a user interface element of the interactive user interface;
- ii. second program code which, when executed by the portable device processor, enables the portable device to communicate with the communications network node;
- iii. third program code which, when executed by the portable device in response to a command resulting from user manipulation of a user interface element of the interactive user interface, causes a communication to be transmitted through the portable device network interface to the communications network node; and
- iv. fourth program code which, when executed by the portable device, processes data content received from the communications network node through the portable device network interface for transmission through the communications interface to the terminal and presentation by the terminal output component.”<sup>25</sup>

32. **Direct Infringement: Roku Streaming Players.** The Roku Streaming Players are portable devices.

33. The Roku Express streaming player is a portable device:

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<sup>25</sup> ‘819 Patent, Claim 184.



<b>Size</b>	Height: 0.75 in (19.0 mm)
	Width: 3.0 in (76.2 mm)
	Depth: 1.5 in (38.1 mm)
<b>Weight</b>	1.1 ounces (31.1 g)

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34. The Roku Express+ streaming player is a portable device:



<b>Size</b>	Height: 0.75 in (19.0 mm)
	Width: 3.0 in (76.2 mm)
	Depth: 1.5 in (38.1 mm)
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<b>Weight</b>	1.1 ounces (31.1 g)

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35. The Roku Express 4K streaming player is a portable device:



<b>Size</b>	Height: 0.8 in (20.8 mm)
	Width: 3.4 in (86.3 mm)
	Depth: 1.5 in (39.3 mm)
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<b>Weight</b>	1.6 ounces (44.6 g)

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36. The Roku Express 4K+ streaming player is a portable device:

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27 <https://www.roku.com/products/roku-express-plus>.

28 <https://www.roku.com/products/roku-express-4k>.



Size	Height: 0.8 in (20.8 mm)
	Width: 3.4 in (86.3 mm)
	Depth: 1.5 in (39.3 mm)
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Weight	1.6 ounces (44.6 g)

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37. The Roku Premier streaming player is a portable device:

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<sup>29</sup> <https://www.roku.com/products/roku-express-4k-plus>.



Size	Height: 0.7 in (17.7 mm)
	Width: 3.3 in (83.8 mm)
	Depth: 1.4 in (36.8 mm)
Weight	1.3 ounces (31.1 g)

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38. The Roku Streaming Stick+ streaming player is a portable device:





<b>Size</b>	Height: 0.8 in (20.3 mm)
	Width: 3.7 in (93.98 mm)
	Depth: 0.47 in (11.9 mm)
<b>Weight</b>	0.9 ounces (25.5 g)

<sup>31</sup>

39. The Roku Streaming Stick 4K streaming player is a portable device. *See, e.g.*, “Roku® Streaming Stick® 4K ... Powerful, portable streaming”<sup>32</sup> *See, e.g., id.*: “If you’re looking for something more powerful and portable, Roku® Streaming Stick® 4K+ features brilliant 4K picture quality and a long-range Wi-Fi® receiver for smoother streaming.”

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<sup>31</sup> <https://www.roku.com/products/streaming-stick-plus>.

<sup>32</sup> <https://www.roku.com/products/players>.



<b>Size</b>	Height: 3.7 in (94.5 mm)
	Width: 0.8 in (21.1 mm)
	Depth: 0.45 in (11.5 mm)
<b>Weight</b>	0.9 ounces (26 g)

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40. The Roku Streaming Stick 4K+ streaming player is a portable device. *See, e.g.*, “Roku® Streaming Stick® 4K+ ... Powerful, portable streaming.”<sup>34</sup>

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<sup>33</sup> <https://www.roku.com/products/roku-streaming-stick-4k>.

<sup>34</sup> <https://www.roku.com/products/players>.



Size	Height: 3.7 in (94.5 mm)
	Width: 0.8 in (21.1 mm)
	Depth: 0.45 in (11.5 mm)
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Weight	0.9 ounces (26 g)

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41. The Roku Streaming Stick+ Headphone Edition streaming player is a portable device. *See, e.g.,* “Roku® Streaming Stick®+ Headphone Edition ... High-performance portability.”<sup>36</sup>

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<sup>35</sup> <https://www.roku.com/products/roku-streaming-stick-4k-plus>.

<sup>36</sup> <https://www.roku.com/products/players>.



<b>Size</b>	Height: 3.7 in (94.5 mm)
	Width: 0.8 in (21.1 mm)
	Depth: 0.47 in (11.9 mm)
<b>Weight</b>	0.9 ounces (25.5 g)

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42. The Roku Ultra LT streaming player is a portable device:



<b>Size</b>	Height: 1.0 in (25.4 mm)
	Width: 4.9 in (124.4 mm)
	Depth: 5.0 in (127 mm)
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<b>Weight</b>	5.9 ounces (167.2 g)

38

43. The Roku Ultra streaming player is a portable device:



<b>Size</b>	Height: 1.0 in (25.4 mm)
	Width: 4.9 in (124.4 mm)
	Depth : 5.0 in (127.0 mm)
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<b>Weight</b>	5.9 ounces (167.2 g)

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44. The Roku Streambar streaming player is a portable device:

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38 <https://www.roku.com/products/roku-ultra-lt>.

39 <https://www.roku.com/products/roku-ultra>.



<b>Size</b>	Height: 2.4 in (60.9 mm)
	Width: 14 in (355.6 mm)
	Depth: 4.2 in (106.6 mm)
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<b>Weight</b>	38.4 ounces (1088.6 g)

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45. The Roku Streambar Pro streaming player is a portable device:

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<sup>40</sup> <https://www.roku.com/products/audio/roku-streambar>.



Size	Height: 2.8 in (71 mm)
	Width: 32.2 in (818 mm)
	Depth: 3.9 in (99 mm)
Weight	88 ounces (2495 g)

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46. The Roku Smart Soundbar streaming player is a portable device:



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<sup>41</sup> <https://www.roku.com/products/audio/roku-streambar-pro>.

**Assembled Product Dimensions (L x W x H)**

3.90 x 32.20 x 2.80 Inches

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47. The Roku Streaming Players are configured to communicate, *e.g.*, via WiFi or Ethernet, with a communications network comprising a communications network node, *e.g.*, the Internet, comprising various servers, *e.g.*, a Roku server or a server associated with other streaming video or audio providers, and to communicate, *e.g.*, via HDMI, with a terminal comprising an output component, such as a television. *See, e.g.*, “Simply plug your Roku player into your TV with an HDMI® Cable or directly, and then follow the on-screen prompts. You’ll need to create a Roku account in order to download and stream channels.”<sup>43</sup> *See also, e.g.*, “All Roku players and streaming sticks connect to your TV’s HDMI port.”<sup>44</sup> *See, e.g., id.:* “Why do I need an Internet connection? Roku streaming players and Roku TVs need Internet access to stream content. They use wireless to connect to your home network, or you can choose a model that offers a wired Ethernet connector.”

48. The Roku Streaming Players are configured to communicate with a communications network, *e.g.*, the Internet, comprising a communications network node, such as a Roku server, or a server associated with other streaming video or audio providers, such as Waco

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<sup>42</sup> <https://www.walmart.com/ip/onn-Roku-Smart-Soundbar-with-built-in-4K-Streaming-Media-Player/642573197>.

<sup>43</sup> <https://www.roku.com/products/players>.

<sup>44</sup> <https://www.roku.com/how-it-works>.



City Cable Channel,<sup>45</sup> Welcome to Waco,<sup>46</sup> 25 News KXXV and KRHD,<sup>47</sup> Austin News from KVUE,<sup>48</sup> Austin News & Weather,<sup>49</sup> Austin Public,<sup>50</sup> and Concertstream – Austin.<sup>51</sup> *See, e.g.*, “Why do I need an Internet connection? Roku streaming players and Roku TVs need Internet access to stream content. They use wireless to connect to your home network, or you can choose a model that offers a wired Ethernet connector.”<sup>52</sup> *See, e.g., id.* (describing “streaming” as “the way video and audio content is delivered over the Internet [to a Roku Streaming Player]” and that Roku Streaming Players “bring the fun and convenience of streaming to your big-screen TV”):

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<sup>45</sup> <https://channelstore.roku.com/details/85329433f23dfa4f3a65e09f93a2b794/waco-city-cable-channel>.

<sup>46</sup> <https://channelstore.roku.com/details/4f331cf3ab3a49b019315b0bfa68ff2f/welcome-to-waco>.

<sup>47</sup> <https://channelstore.roku.com/details/8d7477688c88feb9157425a1905cdb08/25-news-kxxv-and-krhd>.

<sup>48</sup> <https://channelstore.roku.com/details/88f24a75a68aaef441c4b0dee518f2e8/austin-news-from-kvue>.

<sup>49</sup> <https://channelstore.roku.com/details/a96135987069487109a3eb0fd9c5d243/austin-news-and-weather>.

<sup>50</sup> <https://channelstore.roku.com/details/7d9530ac89d22f37f4d9866baba9338e/austin-public>.

<sup>51</sup> <https://channelstore.roku.com/details/037954b0aef8664b318ff977ffd666a9/concertstream-austin>.

<sup>52</sup> <https://www.roku.com/how-it-works>.

### **What is streaming?**

Have you ever watched a YouTube video on your smartphone or a Netflix movie on your laptop? That's streaming. It's the way video and audio content is delivered over the Internet, and has become a popular way to watch TV.

Why? Because streaming lets you watch what you want, the moment you want to. You don't have to wait for a download to finish, your DVR to record, or the show to come on the air.

Roku products bring the fun and convenience of streaming to your big-screen TV. The choice of what to watch and what to pay for is up to you. We like to call it TV on your terms.

49. The Roku Streaming Players are configured to communicate, *e.g.*, via HDMI, with a terminal comprising an output component, such as a television. *See, e.g.*: “Note: All Roku players and streaming sticks connect to your TV’s HDMI port”<sup>53</sup> *See also, e.g.*: “Every Roku player is easy to set up .... Simply plug your Roku player into your TV with an HDMI® Cable or directly.”<sup>54</sup> *See also, e.g.*: “HDMI (High-Definition Multimedia Interface®) is the standard for connecting today's high-definition equipment, transmitting audio, video, and communications between devices over a single connection. With one HDMI cable, you can connect a Blu-ray™ player, game console, or Roku streaming player to your TV for optimal picture and sound, and also take advantage of other HDMI features that help simplify how you set up and use your

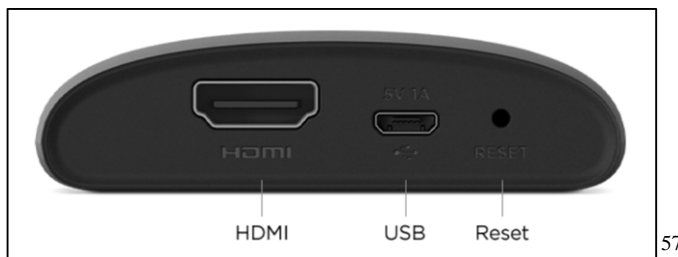
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<sup>53</sup> <https://www.roku.com/how-it-works>.

<sup>54</sup> <https://www.roku.com/products/players>.

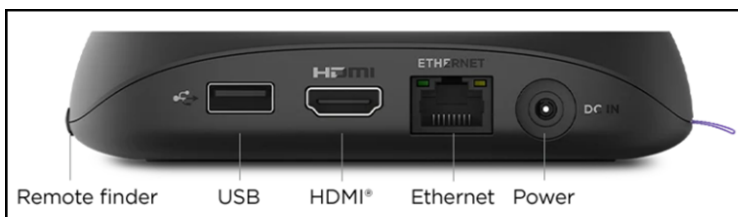
entertainment system.”<sup>55</sup> See also, e.g., “Enjoy smooth HD streaming on your TV at our best price. It’s easy to get started with the included High Speed HDMI® Cable.”<sup>56</sup>

50. For example, the Roku Streaming Player Express has an HDMI connection for a television:



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51. As another example, the Roku Streaming Player Ultra has an HDMI connection for a television:



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52. As another example, the Roku Streaming Player Streambar has an HDMI connection for a television:

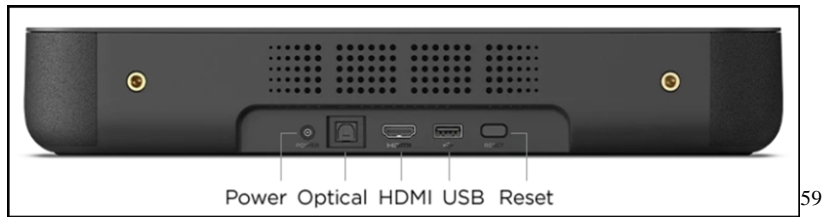
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<sup>55</sup> <https://support.roku.com/article/360033779694>.

<sup>56</sup> <https://www.roku.com/products/roku-express>.

<sup>57</sup> *Id.*

<sup>58</sup> <https://www.roku.com/products/roku-ultra>.



53. The Roku Streaming Players are configured to communicate with a terminal comprising an output component, such as a television, that is configured to present an interactive user interface, such as the Roku graphical user interface or the graphical user interface of streaming video or audio providers, such as Waco City Cable Channel,<sup>60</sup> Welcome to Waco,<sup>61</sup> 25 News KXXV and KRHD,<sup>62</sup> Austin News from KVUE,<sup>63</sup> Austin News & Weather,<sup>64</sup> Austin Public,<sup>65</sup> Concertstream – Austin,<sup>66</sup> and The Roku Channel,<sup>67</sup> comprising at least one user interface element configured to be manipulated by a user to enable control of the Roku Streaming Players. *See, e.g.:*

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<sup>59</sup> <https://www.roku.com/products/audio/roku-streambar>.

<sup>60</sup> <https://channelstore.roku.com/details/85329433f23dfa4f3a65e09f93a2b794/waco-city-cable-channel>.

<sup>61</sup> <https://channelstore.roku.com/details/4f331cf3ab3a49b019315b0bfa68ff2f/welcome-to-waco>.

<sup>62</sup> <https://channelstore.roku.com/details/8d7477688c88feb9157425a1905cdb08/25-news-kxxv-and-krhd>.

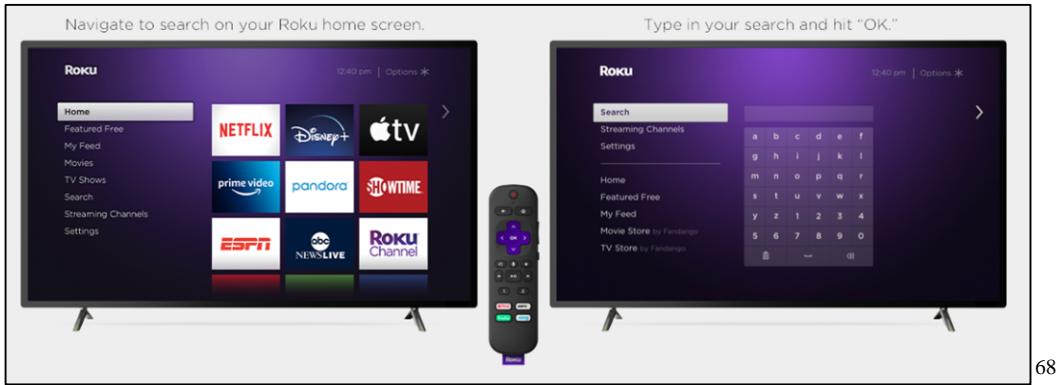
<sup>63</sup> <https://channelstore.roku.com/details/88f24a75a68aaef441c4b0dee518f2e8/austin-news-from-kvue>.

<sup>64</sup> <https://channelstore.roku.com/details/a96135987069487109a3eb0fd9c5d243/austin-news-and-weather>.

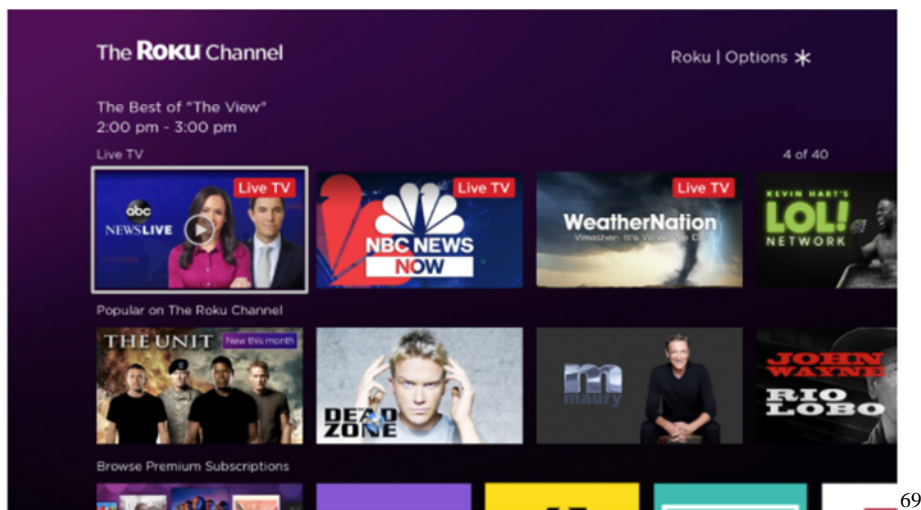
<sup>65</sup> <https://channelstore.roku.com/details/7d9530ac89d22f37f4d9866baba9338e/austin-public>.

<sup>66</sup> <https://channelstore.roku.com/details/037954b0aef8664b318ff977ffd666a9/concertstream-austin>.

<sup>67</sup> <https://therokuchannel.roku.com/>.



54. The Roku graphical user interface comprises at least one user interface element configured to be manipulated by a user to enable control of the Roku Streaming Player, including to browse and watch audio or video content. *See, e.g.:*

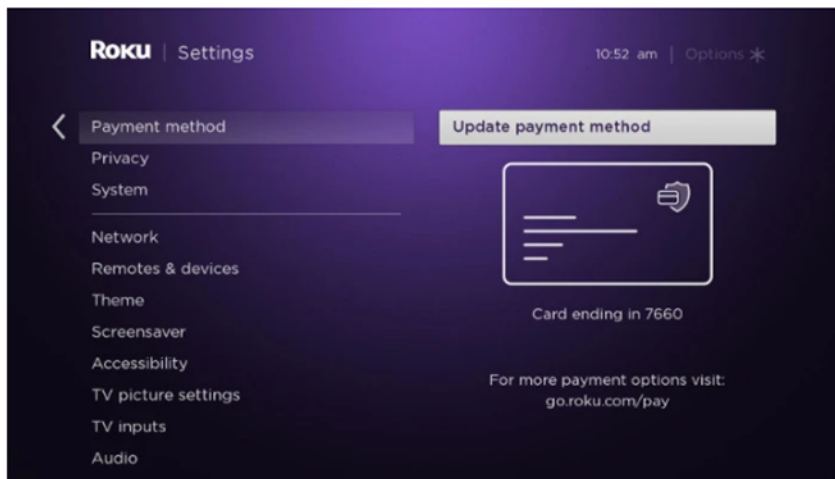


55. As another example, the Roku graphical user interface comprises at least one user interface element configured to be manipulated by a user to enable control of the Roku Streaming Players, including to update or add payment methods. *See, e.g.:*

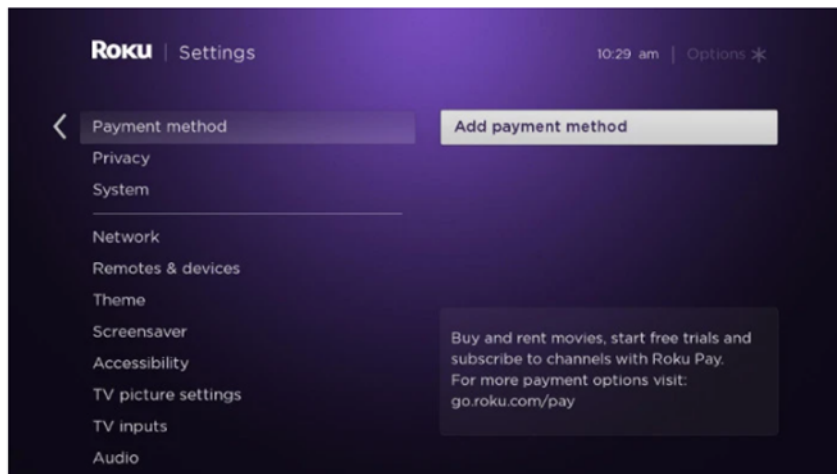
<sup>68</sup> <https://www.roku.com/how-it-works>.

<sup>69</sup> <https://channelstore.roku.com/details/cca8151de08451c477c322d5e27cea3d/the-roku-channel>.

- a. **Update payment method.** Update your existing credit card information, such as expiration date.



- b. **Add payment method.** Add a new credit card to Roku account.



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56. The Roku graphical user interface comprises at least one user interface element configured to be manipulated by a user to enable control of the Roku Streaming Players, including

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<sup>70</sup> <https://support.roku.com/article/208755978>.

to select and add channels. *See, e.g.*: “Just like your smartphone has an ‘app store’ for installing new applications, you can access the Roku Channel Store on your Roku® streaming player or Roku TV™ to add new ‘channels.’ ... You can search the Channel Store on your Roku device ... to find free movies and TV shows.”<sup>71</sup> *See also, e.g., id.*: “Finding free channels using the Channel Store on your Roku device[.]

1. Press the Home button ... on your Roku remote.
2. Scroll up or down and select Streaming Channels to open the Channel Store.
3. Select Top Free to view the most popular free channels.
4. Choose a channel and press the OK button ... to view more options.
5. To install the channel, select Add channel.

Once downloaded, new channels are added to the list of channels under Home on the main screen of your Roku device. Scroll down and you will see your new channel at the bottom of your list of channels. If you prefer, the channel can be moved higher in the list.”

57. As another example, the Roku graphical user interface comprises at least one user interface element configured to be manipulated by a user to enable control of the Roku Streaming Player, including to browse and switch between channels. *See, e.g., id.*: “The Live TV Channel Guide available in The Roku Channel and on the Home screen of your Roku TV provides a convenient way for you to discover and watch free, live movies, news, and TV shows. Easily browse the channel guide, select shows to watch, and quickly switch between channels like you do with a traditional TV guide. You can also quickly change the view of the channel guide to display all channels, recent channels, or favorite channels.”

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<sup>71</sup> <https://support.roku.com/article/208756428>.

58. The Roku Streaming Players include a network interface, such as 802.11bgn, 802.11ac, and 10/100 Base-T Ethernet, configured to enable the transmission of communications between the Roku Streaming Players and a communications network node, such as a Roku server, or a server associated with other streaming video or audio providers. *See, e.g.*, (Roku Express): “Networking 802.11bgn single-band wireless.”<sup>72</sup> *See, e.g.*, (Roku Express+): “Networking 802.11bgn single-band wireless”<sup>73</sup> *See, e.g.*, (Roku Express 4K): “Networking 802.11ac dual-band Wi-Fi® [and] Wired Ethernet requires USB adaptor (sold separately)”<sup>74</sup> *See, e.g.*, (Roku Express 4K+): “Networking 802.11ac dual-band Wi-Fi® [and] Wired Ethernet requires USB adaptor (sold separately)”<sup>75</sup> *See, e.g.*, (Roku Premiere): “Networking 802.11bgn single-band wireless”<sup>76</sup> *See, e.g.*, (Roku Streaming Stick+): “Networking 802.11ac MIMO dual-band wireless”<sup>77</sup> *See, e.g.*, (Roku Streaming Stick 4K): “Networking 802.11ac MIMO dual-band Wi-Fi®”<sup>78</sup> *See, e.g.*, (Roku Streaming Stick 4K+): “Networking 802.11ac MIMO dual-band Wi-Fi®”<sup>79</sup> *See, e.g.*, (Roku Streaming Stick+ Headphone Edition): “Networking 802.11ac MIMO dual-band Wi-Fi®”<sup>80</sup> *See, e.g.*, (Roku Ultra): “Networking 802.11ac dual-band MIMO Wi-Fi®

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<sup>72</sup> <https://www.roku.com/products/roku-express>.

<sup>73</sup> <https://www.roku.com/products/roku-express-plus>.

<sup>74</sup> <https://www.roku.com/products/roku-express-4k>.

<sup>75</sup> <https://www.roku.com/products/roku-express-4k-plus>.

<sup>76</sup> <https://www.roku.com/products/roku-premiere>.

<sup>77</sup> <https://www.roku.com/products/streaming-stick-plus>.

<sup>78</sup> <https://www.roku.com/products/roku-streaming-stick-4k>.

<sup>79</sup> <https://www.roku.com/products/roku-streaming-stick-4k-plus>.

<sup>80</sup> <https://www.roku.com/products/roku-streaming-stick-plus-headphone-edition>.



[and] 10/100 Base-T Ethernet”<sup>81</sup> *See, e.g.*, (Roku Ultra LT): “Networking 802.11ac dual-band MIMO Wi-Fi® [and] 10/100 Base-T Ethernet”<sup>82</sup> *See, e.g.*, (Roku Streambar): “Networking 802.11ac dual-band, MIMO Wi-Fi® [and] Wired Ethernet requires USB adaptor (sold separately).”<sup>83</sup> *See, e.g.*, (Roku Streambar Pro): “Network 802.11ac dual-band, MIMO Wi-Fi®”<sup>84</sup>

59. The Roku Streaming Players are configured to receive, via the network interface, data content, such as a data stream, transmitted from Roku servers or from other streaming video or audio providers’ servers to the Roku Streaming Players. *See, e.g.*: “Why do I need an Internet connection? Roku streaming players and Roku TVs need Internet access to stream content. They use wireless to connect to your home network, or you can choose a model that offers a wired Ethernet connector.”<sup>85</sup> *See, e.g., id.* (describing that “streaming” is “the way video and audio content is delivered over the Internet [to a Roku Streaming Player]”).

60. The Roku Streaming Players include a communications interface, such as an HDMI interface, configured to enable the transmission of communications between the Roku Streaming Players and a terminal comprising an output component, such as a television with an HDMI port, and where the communication comprises a data content stream, such as streaming video content, transmitted via HDMI from the Roku Streaming Player to the television for display.

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<sup>81</sup> <https://www.roku.com/products/roku-ultra>.

<sup>82</sup> <https://www.roku.com/products/roku-ultra-lt>.

<sup>83</sup> <https://www.roku.com/products/audio/roku-streambar>.

<sup>84</sup> <https://www.roku.com/products/audio/roku-streambar-pro>.

<sup>85</sup> <https://www.roku.com/how-it-works>.

*See, e.g.*, (Roku Express): “It’s easy to get started with the included High Speed HDMI® Cable. With access to hundreds of free channels, there’s plenty to stream without spending extra.”<sup>86</sup> *See, e.g.*, (Roku Express+): “Compatibility ... Works with any TV with HDMI®”<sup>87</sup> *See, e.g.*, (Roku Express 4K): “TV Compatibility ... Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>88</sup> *See, e.g.*, (Roku Express 4K+): “TV Compatibility ... Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>89</sup> *See, e.g.*, (Roku Premiere): “TV Compatibility ... 4K UHD TVs ... TV must have an HDMI input that supports HDCP 2.2[,] 4K UHD HDR TVs ... TV must have an HDMI input that supports HDCP 2.2.”<sup>90</sup> *See, e.g.*, (Roku Streaming Stick+): “TV Compatibility ... Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>91</sup> *See, e.g.*, (Roku Streaming Stick+ Headphone Edition): “TV Compatibility ... Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>92</sup> *See, e.g.*, (Roku Streaming Stick 4K): “TV Compatibility ... 4K TVs\* ... 4K HDR TVs\* ... \*Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>93</sup> *See, e.g.*, (Roku Streaming Stick 4K+): “TV Compatibility ... 4K TVs\* ... 4K HDR TVs\* ... \*Requires compatible TV with an HDMI input

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<sup>86</sup> <https://www.roku.com/products/roku-express>.

<sup>87</sup> <https://www.roku.com/products/roku-express-plus>.

<sup>88</sup> <https://www.roku.com/products/roku-express-4k>.

<sup>89</sup> <https://www.roku.com/products/roku-express-4k-plus>.

<sup>90</sup> <https://www.roku.com/products/roku-premiere>.

<sup>91</sup> <https://www.roku.com/products/streaming-stick-plus>.

<sup>92</sup> <https://www.roku.com/products/roku-streaming-stick-plus-headphone-edition>.

<sup>93</sup> <https://www.roku.com/products/roku-streaming-stick-4k>.

that supports HDCP 2.2.”<sup>94</sup> *See, e.g.*, (Roku Ultra): “TV Compatibility ... 4K TVs\* ... 4K HDR TVs\* ... \*Requires compatible TV with an HDMI® input that supports HDCP 2.”<sup>95</sup> *See, e.g.*, (Roku Ultra LT): “TV Compatibility ... 4K TVs\*... 4K HDR TVs\* ... \*Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>96</sup> *See, e.g.*, (Roku Streambar): “TV Compatibility ... Requires TV with HDMI ARC or Optical outputs ... 4K TVs ... TV must have an HDMI input that supports HDCP 2.2[,] 4K HDR TVs ... TV must have an HDMI input that supports HDCP 2.2”<sup>97</sup> *See, e.g.*, (Roku Streambar Pro): “TV Compatibility ... 4K UHD TVs ... TV must have an HDMI input that supports HDCP 2.2[,] 4K UHD HDR TVs ... TV must have an HDMI input that supports HDCP 2.2 ... Requires TV with HDMI ARC or Optical outputs”<sup>98</sup> *See, e.g., id.*: “Will Roku Streambar Pro work on any TV? Yes, Roku® Streambar™ Pro will work on any TV with an HDMI® port.” *See, e.g.*, (Roku Smart Soundbar): “Super simple setup: Just plug it into your TVs HDMI-ARC port with the included Premium High-Speed HDMI® Cable and connect to the internet.”<sup>99</sup>

61. The HDMI interface is configured to enable the transmissions of communications between Roku Streaming Players and any television with an HDMI port. *See, e.g.*: “Your Roku streaming device can be connected to any television with an HDMI® port. To make this

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<sup>94</sup> <https://www.roku.com/products/roku-streaming-stick-4k-plus>.

<sup>95</sup> <https://www.roku.com/products/roku-ultra>.

<sup>96</sup> <https://www.roku.com/products/roku-ultra-lt>.

<sup>97</sup> <https://www.roku.com/products/audio/roku-streambar>.

<sup>98</sup> <https://www.roku.com/products/audio/roku-streambar-pro>.

<sup>99</sup> <https://www.walmart.com/ip/onn-Roku-Smart-Soundbar-with-built-in-4K-Streaming-Media-Player/642573197>.

connection, a Roku player requires an HDMI cable while a Roku Streaming Stick connects directly with its built-in HDMI connector. When selecting an HDMI cable, we recommend that you use a High Speed HDMI Cable if your TV only supports 720p and 1080p, or a Premium High Speed HDMI Cable if your TV also supports 4K Ultra HD or HDR.”<sup>100</sup>

62. The Roku Streaming Players include a processor configured to stream data content for presentation by the terminal output component. For example, on information and belief, the Roku Streaming Players contain the following processors:<sup>101</sup>

Roku Streaming Player	Processor
Roku Express	ARM Cortex A53
Roku Express	MIPS 900 MHz
Roku Express+	ARM Cortex A53
Roku Express+	MIPS 900 MHz
Roku Express 4K	ARM Cortex A55
Roku Express 4K+	ARM Cortex A55
Roku Premiere	ARM Cortex A53
Roku Premiere	ARM Cortex A53 quad core 1.2 GHz
Roku Premiere+	ARM Cortex A53
Roku Premiere+	ARM Cortex A53 quad core 1.2 GHz
Roku Smart Soundbar	ARM Cortex A53
Roku Streambar	MStar C2
Roku Streambar Pro	On information and belief, the Roku Streambar Pro includes a processor configured to stream data content for presentation by the terminal output component.
Roku Streaming Stick	ARM Cortex A53
Roku Streaming Stick	ARM Cortex A7 quad core 800 MHz
Roku Streaming Stick	ARM11 600 MHz
Roku Streaming Stick+	ARM Cortex A53
Roku Streaming Stick+ Headphone Edition	On information and belief, the Roku Streaming Stick+ Headphone Edition includes a processor configured to stream data content for presentation by the terminal output component.

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<sup>100</sup> <https://support.roku.com/article/208754888>.

<sup>101</sup> <https://developer.roku.com/docs/specs/hardware.md>.

Roku Streaming Player	Processor
Roku Streaming Stick 4K	ARM Cortex A55
Roku Streaming Stick 4K+	ARM Cortex A55
Roku Ultra	ARM Cortex A53 quad core 1.2 GHz
Roku Ultra	ARM Cortex A53
Roku Ultra	ARM Cortex A55
Roku Ultra LT	ARM Cortex A53
Roku Ultra LT	ARM Cortex A55

63. The Roku Streaming Players comprise a memory having executable program code stored thereon. For example, on information and belief, Roku Streaming Players include one or more of RAM, ROM, flash memory, non-volatile memory, or other storage devices or internal or on-board memory. For example, the Roku Streaming Players include a processor which contains on-board memory. For example, the Arm Cortex A53 processor contains 128K-2048K L2 Cache, and four cores, each with 8K-64K L1 Instruction Cache, and 8K-64K L1 Data Cache.<sup>102</sup> For example, on information and belief, the Roku Streaming Players also include onboard RAM. *See, e.g.:*<sup>103</sup>

Roku Streaming Player	CPU	RAM
Roku Express	ARM Cortex A53	512 MB
Roku Express	MIPS 900 MHz	512 MB
Roku Express+	ARM Cortex A53	512 MB
Roku Express+	MIPS 900 MHz	512 MB
Roku Express 4K	ARM Cortex A55	1 GB
Roku Express 4K+	ARM Cortex A55	1 GB
Roku Premiere	ARM Cortex A53	1 GB
Roku Premiere	ARM Cortex A53 quad core 1.2 GHz	1 GB
Roku Premiere+	ARM Cortex A53	1 GB MB
Roku Premiere+	ARM Cortex A53 quad core 1.2 GHz	1 GB
Roku Smart Soundbar	ARM Cortex A53	1 GB MB
Roku Streambar	MStar C2	1 GB

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<sup>102</sup> <https://developer.arm.com/ip-products/processors/cortex-a/cortex-a53>.

<sup>103</sup> <https://developer.roku.com/docs/specs/hardware.md>.

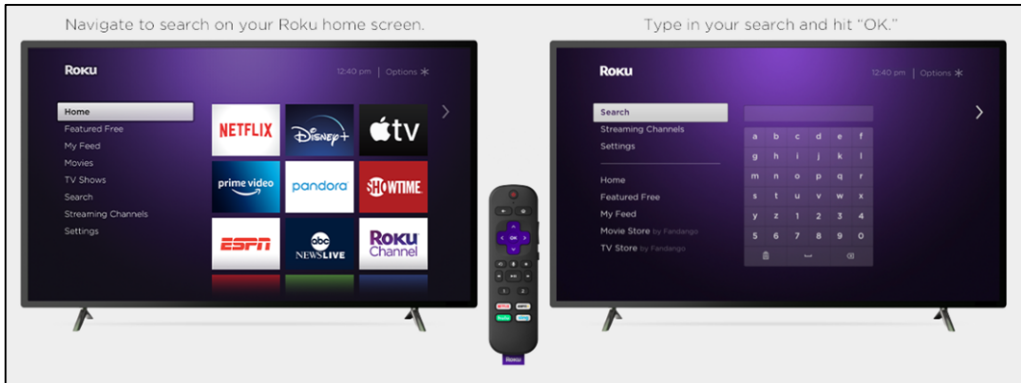
Roku Streambar Pro	On information and belief, the Roku Streambar Pro includes memory having executable program code stored thereon.	
Roku Streaming Stick	ARM Cortex A53	512 MB
Roku Streaming Stick	ARM Cortex A7 quad core 800 MHz	512 MB
Roku Streaming Stick	ARM11 600 MHz	256 MB
Roku Streaming Stick	ARM11 600 MHz	512 MB
Roku Streaming Stick+	ARM Cortex A53	1 GB
Roku Streaming Stick+ Headphone Edition	On information and belief, the Roku Streaming Stick+ Headphone Edition includes memory having executable program code stored thereon.	
Roku Streaming Stick 4K	ARM Cortex A55	1 GB
Roku Streaming Stick 4K+	ARM Cortex A55	1 GB
Roku Ultra	ARM Cortex A53 quad core 1.2 GHz	1 GB
Roku Ultra	ARM Cortex A53	1 GB
Roku Ultra	ARM Cortex A53	2 GB
Roku Ultra	ARM Cortex A55	2 GB
Roku Ultra LT	ARM Cortex A53	1 GB
Roku Ultra LT	ARM Cortex A55	2 GB

64. Additionally, the Roku Streaming Players store program code, for example, the Roku OS, on the processor's on-board memory and/or RAM, ROM, flash memory, non-volatile memory, or other storage devices or internal or on-board memory.

65. On information and belief, the Roku Streaming Players include program code stored on internal or on-board memory which, when executed by the Roku Streaming Players, presents an interactive user interface, for example, the Roku graphical user interface, on the television's display, which allows users to "[n]avigate to search on your Roku home screen" or to "[t]ype in your search and hit 'OK'."<sup>104</sup> *See also, id.:*

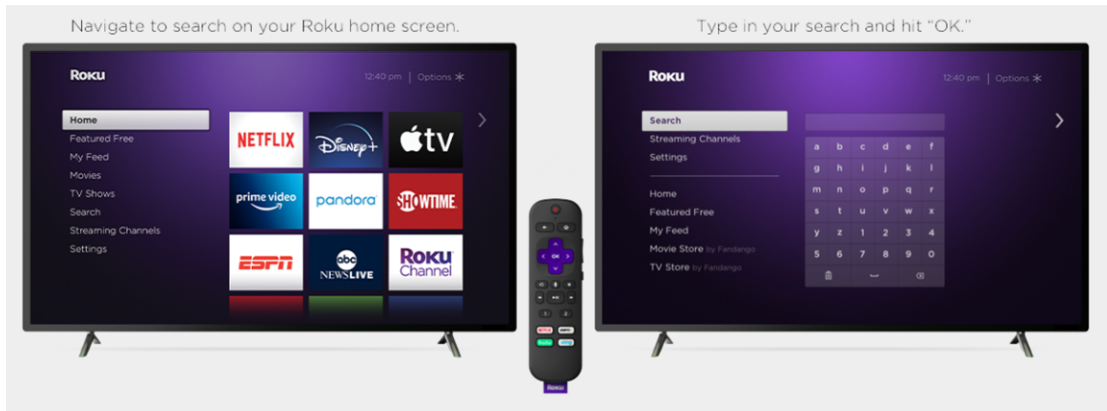
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<sup>104</sup> <https://www.roku.com/how-it-works>



66. On information and belief, program code stored on the memory of the Roku Streaming Players receives a command resulting from user manipulation of an interface element of the Roku graphical user interface or the graphical user interface of streaming video or audio providers, for example a button, icon, alphanumeric element, menu, or graphic, and causes a communication to the Roku Streaming Players' processors in response to the command resulting from user manipulation of the user interface element.

67. For example, program code stored on the memory of the Roku Streaming Players, when executed, presents, on a television's display, the Roku graphical user interface or the graphical user interface of streaming video or audio providers, which is an interactive user interface with user interface elements that can be manipulated by the user using a Roku Streaming Player. *See, e.g. id:*



68. For example, a user can manipulate a user interface element of the Roku graphical user interface by pressing the navigation, OK, arrows and/or other buttons on a Roku remote control to, for example, manipulate a user interface element of the interactive user interface to search for entertainment choices. *See, e.g.:* “Search using the on-screen keyboard [-] After pressing the Home button ... on your Roku remote, navigate up or down and select Search. Start typing the first few letters of the movie, TV show, actor, director, genre, or channel, and Roku Search will update the results as you complete the word or phrase. When you find the entertainment choice or channel you are looking for, select the entry to see more details including viewing options.”<sup>105</sup> *See, e.g., id.:* “To find specific content or see related choices, you can search by title, actor, or director. When you want to browse a wider range of content, you can search for popular genres like ‘Comedy’ or ‘Action’ to see Roku Zones with a variety of categories that may include free offerings, subscription content, on-demand titles, 4K movies and shows, and more.”

69. On information and belief, program code stored on the memory of the Roku Streaming Players, when executed, causes a communication to the Roku Streaming Players’ processors in response to the command resulting from user manipulation of a user interface

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<sup>105</sup> <https://support.roku.com/article/208756398>.



element of the Roku graphical user interface or the graphical user interface of streaming video or audio providers to present additional viewing options or to stream audio or video content from a Roku server, or a server associated with other streaming video or audio providers. *See, e.g. id.:* “Search using the on-screen keyboard [-] After pressing the Home button ... on your Roku remote, navigate up or down and select Search. Start typing the first few letters of the movie, TV show, actor, director, genre, or channel, and Roku Search will update the results as you complete the word or phrase. When you find the entertainment choice or channel you are looking for, select the entry to see more details including viewing options.”

70. On information and belief, the Roku Streaming Players include program code stored on internal memory that, when executed by the Roku Streaming Players’ processors, enables the Roku Streaming Players to communicate with a communications network node, such as a Roku server, or a server associated with other streaming video or audio providers. *See, e.g.:* “SSL is the primary method provided for developers to implement content and/or communications security for their application. The device supports both client and server authentication via SSL to provide a secure communications channel between trusted endpoints.”<sup>106</sup>

71. On information and belief, the Roku Streaming Players’ processors execute code which enables the Roku Streaming Players to communicate with the communications network node on the Internet. *See, e.g.:* “Your Roku® streaming player or Roku TV™ provides you with

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<sup>106</sup> <https://developer.roku.com/docs/features/security.md>.

access to stream audio and video from the internet. For this to work, your Roku device must maintain a good connection to your network and the internet.”<sup>107</sup>

72. On information and belief, the Roku Streaming Players’ processors execute code which enables the Roku Streaming Players to communicate with the communications network node on the Internet, either wirelessly or through a wired cable. *See, e.g.*: “SSL is the primary method provided for developers to implement content and/or communications security for their application. The device supports both client and server authentication via SSL to provide a secure communications channel between trusted end-points.”<sup>108</sup> *See, e.g.*: “When you turn on your Roku streaming player or Roku TV™ for the first time, your device will automatically prompt you to establish a connection to the internet over Wi-Fi or Ethernet cable. It is important that a connection between your Roku device, your home network, and the internet is established in order to stream audio and video.”<sup>109</sup>

73. On information and belief, the Roku Streaming Players include program code stored on internal memory that, when executed by the Roku Streaming Players in response to a command resulting from user manipulation of a user interface element of the Roku interactive user interface or the graphical user interface of streaming video or audio providers, causes a communication to be transmitted through the Roku Streaming Players’ network interface to the communications network node, such as a Roku server, or a server associated with other streaming video or audio providers. *See, e.g.*: “Search by title, actor, or director using your Roku remote ...

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<sup>107</sup> <https://support.roku.com/article/115015678567>.

<sup>108</sup> <https://developer.roku.com/docs/features/security.md>.

<sup>109</sup> <https://support.roku.com/article/115015760328>.

or voice search. Roku Search will tell you where your content is available for free or show you results across top channels ranked by price”<sup>110</sup>

74. On information and belief, Roku Streaming Players execute code stored on internal memory, in response to a command resulting from user manipulation of a user interface element of the Roku interactive user interface, which causes a communication to be transmitted through the Roku Streaming Players’ network interface to the communication network node on the Internet, either wirelessly or through a wired cable. *See, e.g.:* “Your Roku® streaming player or Roku TV™ provides you with access to stream audio and video from the internet. For this to work, your Roku device must maintain a good connection to your network and the internet.”<sup>111</sup> *See, e.g.:* “When you turn on your Roku streaming player or Roku TV™ for the first time, your device will automatically prompt you to establish a connection to the internet over Wi-Fi or Ethernet cable. It is important that a connection between your Roku device, your home network, and the internet is established in order to stream audio and video.”<sup>112</sup>

75. For example, when a user interacts with the Roku interactive user interface to select a movie/program for viewing, on information and belief the Roku Streaming Players execute program code to cause a communication to be transmitted through the Roku Streaming Players’ interface to the content host server.<sup>113</sup>

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<sup>110</sup> <https://www.roku.com/how-it-works>.

<sup>111</sup> <https://support.roku.com/article/115015678567>.

<sup>112</sup> <https://support.roku.com/article/115015760328>.

<sup>113</sup> <https://support.roku.com/article/360036652634>.

76. As an additional example: A user may interact with the Roku Streaming Players' "[o]n-screen setup and activation" graphical user interface to set up WiFi access to the user's LAN and to the Internet. When the user selects a WiFi network and enters the associated password on the Roku on-screen setup and activation user interface, on information and belief, the Roku Streaming Players execute program code to cause a communication to be transmitted to the Roku server to check for software updates. *See, e.g.*: "Choose your wireless network from the list of available networks and enter your password. This is most often the same network you use to connect your computer or smartphone to the internet. ... If you want to see your password as you type, choose Show password. This can help prevent entering the wrong password. ... Once you enter your password and select Connect, your Roku device automatically connects to the internet. You can get more help if you are unable to connect to your wireless network. ... Once connected to the internet, your Roku device checks for an available software update, downloads the latest version if necessary, and then reboots."<sup>114</sup>

77. As an additional example: A user may interact with the Guided Setup interactive user interface to activate the Roku Streaming Players. When the user enters an email address in the Guided Setup interactive user interface, on information and belief, the Roku Streaming Players execute program code to cause a communication to be transmitted to the Roku server. *See, e.g.*, "Once you have followed the hardware setup instructions included in the Quick Start Guide that came with your Roku device, you are ready to follow the on-screen setup and activation known as Guided Setup. During Guided Setup, you will be prompted to enter an email

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<sup>114</sup> <https://support.roku.com/article/208754888>.

address to begin the activation process. ... Use your computer or smartphone to access your inbox and locate the email from Roku with the activation link.”<sup>115</sup>

78. As an additional example: A user may interact with the Roku interactive user interface to add a channel (*e.g.*, Austin News & Weather<sup>116</sup>) to the Roku Streaming Players. When the user selects the “Add channel” button on the Roku Home interactive user interface, on information and belief the Roku Streaming Players execute program code to cause a communication to be transmitted to the Roku server. *See, e.g.*: “The page will also contain an “Add channel” button, which will automatically add the channel to your homescreen. You may be asked to enter your billing password if the channel costs money.”<sup>117</sup>

79. As an additional example: A user may interact with the Roku Home interactive user interface to update/add a payment method linked to the user’s Roku account. When the user clicks the Update payment method button, enters the credit card information, and clicks the Save card button, on information and belief the Roku Streaming Players execute program code to cause a communication to be transmitted to the Roku server to update the user’s account profile. *See, e.g.*:

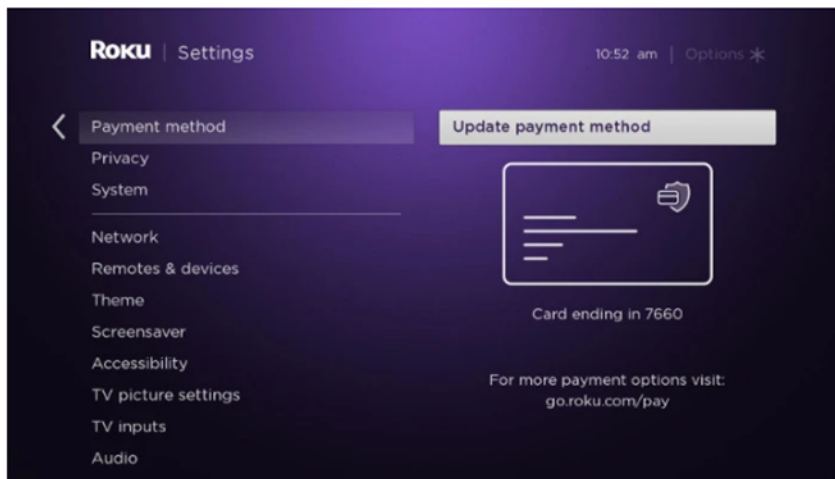
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<sup>115</sup> <https://support.roku.com/article/235180868>.

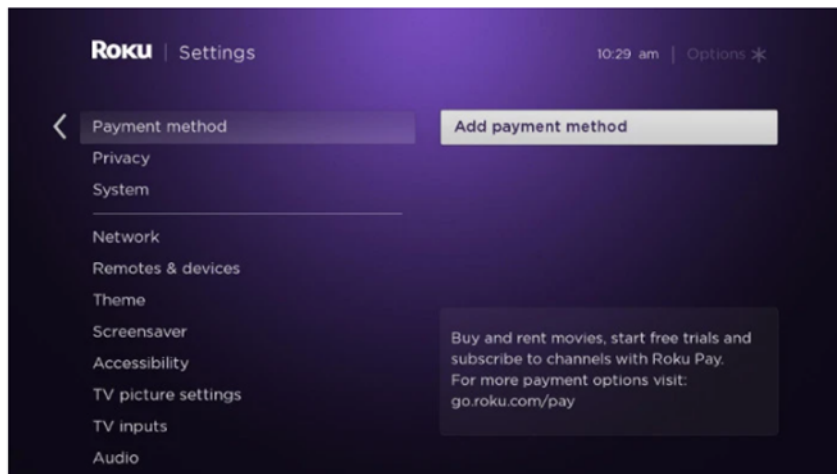
<sup>116</sup> <https://channelstore.roku.com/details/a96135987069487109a3eb0fd9c5d243/austin-news-and-weather>.

<sup>117</sup> <https://developer.roku.com/docs/features/engagement/channel-store.md>.

- a. **Update payment method.** Update your existing credit card information, such as expiration date.



- b. **Add payment method.** Add a new credit card to Roku account.



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80. As an additional example: A user may interact with the Roku Home interactive user interface to check for Roku Streaming Player software/firmware updates. When the user

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<sup>118</sup> <https://support.roku.com/article/208755978>.

selects the Check Now button, on information and belief the Roku Streaming Players execute program code to cause a communication to be transmitted to the Roku account server. *See, e.g.:* “Select Check Now to manually check for updates[.] If there is new software available or there are updates for your channels, then your Roku device will download and install them automatically and once completed, your Roku device will reboot.”<sup>119</sup>

81. On information and belief, the Roku Streaming Players include program code stored on internal memory that, when executed by the Roku Streaming Players, processes data content, such as a data stream, received from a Roku server, or a server associated with other streaming video or audio providers, through the Roku Streaming Players’ network interface for transmission, *e.g.*, via the Roku Streaming Players’ HDMI interface, to the television for presentation on the television’s display, *e.g.*, streaming video content. *See, e.g.:* “The Roku OS supports High-bandwidth Digital Content Protection (HDCP) for content copy protection between the Roku player’s HDMI port and the connected display. In addition, 4K-capable Roku devices support the Trusted Execution Environment (TEE).”<sup>120</sup> *See also, e.g.:* “A Roku player is a device that lets you easily enjoy the internet on your TV, which is called “streaming.” You can stream channels ... on the big screen, plus get access to 500,000+ movies and TV episodes across thousands of free and paid channels. You can even sign into network TV channels with

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<sup>119</sup> <https://support.roku.com/article/208755668>.

<sup>120</sup> <https://developer.roku.com/docs/features/security.md>.

your cable login and use your Roku player as an extra cable box to save on monthly bills.”<sup>121</sup> *See, e.g.*: “All Roku players and streaming sticks connect to your TV’s HDMI port.”<sup>122</sup>

82. As another example, on information and belief, the Roku Streaming Players include program code stored on internal memory that, when executed by the Roku Streaming Players, processes data received from a Roku server, or a server associated with other streaming audio providers, such as Concertstream – Austin,<sup>123</sup> through the Roku Streaming Players’ network interface for transmission, *e.g.*, via the Roku Streaming Players’ HDMI interface, to the television for presentation by the television’s speakers or audio output, *e.g.*, streaming audio content. *See, e.g.*: “Along with watching movies and TV shows on your Roku streaming player or Roku TV™, you can also listen to music, radio stations, podcasts, and more from popular streaming services....”<sup>124</sup> *See, e.g., id.*: “Many great music channels are available on your Roku device offering a wide variety of audio content. You can listen to top tracks from your favorite artists, radio stations from across the globe, trending podcasts, the latest news, and more.”

83. As another example, on information and belief, the Roku Streaming Players include program code stored on internal memory that, when executed by the Roku Streaming Players, processes live data streams received from a Roku server, or a server associated with other streaming video or audio providers, such as Austin News from KVUE,<sup>125</sup> through the Roku

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<sup>121</sup> <https://www.roku.com/products/players>.

<sup>122</sup> <https://www.roku.com/how-it-works>.

<sup>123</sup> <https://channelstore.roku.com/details/037954b0aef8664b318ff977ffd666a9/concertstream-austin>.

<sup>124</sup> <https://support.roku.com/article/360009670653>.

<sup>125</sup> <https://channelstore.roku.com/details/88f24a75a68aaef441c4b0dee518f2e8/austin-news-from-kvue>.



Streaming Players’ network interface for transmission, and transmits a live data stream, *e.g.*, via the Roku Streaming Players’ HDMI interface, to the television for presentation by the television’s display and/or speakers, *e.g.*, live video or audio content. *See, e.g.*: “We get it, TV lovers—cutting the cord is a big step. For decades, the cable box was an important member of many households. However, with the plethora of streaming options now available, it’s never been easier to kick that cable box to the curb and make the switch to live TV streaming with Roku devices.”<sup>126</sup> *See also, e.g.*, “Stay up-to-date with the latest news and weather in the Austin area on the all-new KVUE News channel from KVUE. Our channel features the latest breaking news that impacts you and your family, weather and live video from our newscasts and local events.”<sup>127</sup>

84. As another example, on information and belief, the Roku Streaming Players include program code stored on internal memory that, when executed by the Roku Streaming Players, processes a data stream received from a Roku server, or a server associated with other streaming video or audio providers, for transmission through the communications interface to the television for presentation on the television’s display by the television’s speakers or the television’s’ audio output, where the data stream comprises advertisement content. *See, e.g.*: “The Roku platform enables technical video advertisement propagation and monetization for our channel partners.”<sup>128</sup> *See, e.g., id.*: “All channels on the Roku platform must utilize Roku’s custom advertising framework, RAF, for fulfilling and rendering video advertisements. Channels powered by Direct Publisher automatically satisfy this requirement, but channels built using

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<sup>126</sup> <https://www.roku.com/blog/cable-alternatives>.

<sup>127</sup> <https://channelstore.roku.com/details/88f24a75a68aaef441c4b0dee518f2e8/austin-news-from-kvue>.

<sup>128</sup> <https://developer.roku.com/docs/features/monetization/video-advertisements.md>.

Roku's developer toolkit must implement RAF on their own. Channels will not be certified or published to the Channel Store until this requirement is met.”

85. On information and belief, the Roku Streaming Players employ a secure communication protocol to securely communicate through the Roku Streaming Players’ network interface with a Roku server, or a server associated with other streaming video or audio providers. *See, e.g.*: “Security on the Roku platform The Roku Platform is designed to protect each channel's intellectual property, while ensuring the audience is safe from malicious attacks. Roku devices are designed to play a variety of streaming content directly from the Internet. We understand that this content is valuable to the content owners and must be protected from unauthorized access to prevent both casual and professional copying and distribution. Multiple types of security provisions are available if needed.”<sup>129</sup>

86. On information and belief, the Roku Streaming Players are configured at the Roku factory to employ a secure communication protocol. *See, e.g., id.*: “System security The Roku platform has been designed to be hardened against unauthorized attack. This process starts at the Roku factory as each system is individualized and uniquely keyed as a foundation for robust security. The platform supports a secure key store and hardware encryption engine. The core set of system software has been encrypted and is protected by a secure boot process and the use of signed binaries. SSL is the primary method provided for developers to implement content and/or communications security for their application. The device supports both client and server authentication via SSL to provide a secure communications channel between trusted end-points.”

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<sup>129</sup> <https://developer.roku.com/docs/features/security.md>.

87. On information and belief, the Roku Streaming Players' secure communication protocol facilitates secure communications to facilitate electronic payment transactions. *See, e.g.:* "What is Roku® Pay? Roku Pay lets you make purchases directly from your Roku streaming device. If you added a payment method while activating your device, you can begin using Roku Pay right away. Otherwise, you can add a payment method to get started. Adding or changing your payment method will not result in charges to your account unless you have taken additional steps such as signing up for a subscription."<sup>130</sup>

88. By infringing the '819 Patent, Roku has caused and will continue to cause Plaintiff IOENGINE to suffer damages in an amount to be determined at trial, *i.e.*, in an amount that cannot be less than would constitute a reasonable royalty for the use of the patented technology, together with pre-judgment and post-judgment interest thereon.

89. To the extent that Roku has continued or continues to make, have made, use, import, sell, or offer for sale products or services that infringe the '819 Patent following its awareness of the '819 Patent, Roku's infringement is willful and entitles IOENGINE to an award of enhanced damages pursuant to 35 U.S.C. § 284 and attorneys' fees pursuant to 35 U.S.C. § 285.

**SECOND COUNT FOR RELIEF**  
**(INDIRECT INFRINGEMENT OF THE '819 PATENT)**

90. IOENGINE repeats, re-alleges, and incorporates by reference the preceding paragraphs as if fully set forth herein, including but not limited to Paragraphs 21-89.

91. On information and belief, Roku has infringed and continues to infringe indirectly by way of inducement and contributory infringement, literally and/or under the doctrine of

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<sup>130</sup> <https://support.roku.com/article/360021144894>.

equivalents, in violation of 35 U.S.C. § 271, one or more claims of the '819 Patent by performing, without authority, one or more of the following acts: making, having made, using, importing, selling, and offering for sale in the United States one or more products or services that embody the invention claimed in the '819 Patent, including but not limited to the Roku Infringing Products, and encouraging and instructing its customers, end-users, partners, and third parties to use the Roku Infringing Products in a manner that directly infringes the '819 Patent. Roku additionally contributes to and induces direct infringement by its customers, end-users, partners, and other third parties by instructing and encouraging them to use the Roku Infringing Products in a manner that directly infringes at least one claim of the '819 Patent, including by streaming video and audio from services such as Waco City Cable Channel,<sup>131</sup> Welcome to Waco,<sup>132</sup> 25 News KXXV and KRHD,<sup>133</sup> Austin News from KVUE,<sup>134</sup> Austin News & Weather,<sup>135</sup> Austin Public,<sup>136</sup> Concertstream – Austin,<sup>137</sup> and The Roku Channel.<sup>138</sup>

92. Since at least after receiving notice of this Complaint, Roku has knowingly contributed to the direct infringement of and induced direct infringement of, and continues to knowingly contribute to the direct infringement of and induce direct infringement of, one or more

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<sup>131</sup> <https://channelstore.roku.com/details/85329433f23dfa4f3a65e09f93a2b794/waco-city-cable-channel>.

<sup>132</sup> <https://channelstore.roku.com/details/4f331cf3ab3a49b019315b0bfa68ff2f/welcome-to-waco>.

<sup>133</sup> <https://channelstore.roku.com/details/8d7477688c88feb9157425a1905cdb08/25-news-kxxv-and-krhd>.

<sup>134</sup> <https://channelstore.roku.com/details/88f24a75a68aaef441c4b0dee518f2e8/austin-news-from-kvue>.

<sup>135</sup> <https://channelstore.roku.com/details/a96135987069487109a3eb0fd9c5d243/austin-news-and-weather>.

<sup>136</sup> <https://channelstore.roku.com/details/7d9530ac89d22f37f4d9866baba9338e/austin-public>.

<sup>137</sup> <https://channelstore.roku.com/details/037954b0aef8664b318ff977ffd666a9/concertstream-austin>.

<sup>138</sup> <https://therokuchannel.roku.com/>.

claims of the '819 Patent by its customers, end-users, partners, and third parties with specific intent that the Roku Infringing Products be used by its customers, end-users, partners, and third parties to directly infringe the '819 Patent, which products constitute a material part of the invention and are not staple articles or commodities of commerce suitable for substantial non-infringing use.

93. Roku instructs and encourages its customers, end-users, partners, and third parties to configure and to use the Roku Infringing Products in a manner that directly infringes at least Claim 184 of the '819 Patent, including to stream video and audio.

94. In addition, Roku provides software development kits that allow, instruct, and encourage customers, end-users, partners (including, but not limited to, developers, advertisers, affiliates, beta testers, and service providers<sup>139</sup>), and other third parties to use the Roku Infringing Products in a manner that infringes at least one claim of each of the Patents-in-Suit, including by providing “an open streaming platform,” on which “Roku welcomes publishers and developers to grow their audience with Roku.”<sup>140</sup> Roku further instructs and encourages the infringing use of the Roku Infringing Products by maintaining a Roku Developers website which offers courses, demonstrations, a knowledge center, and developer tools and forums. *See, also, id.* Roku also instructs and encourages the infringing use of the Roku Infringing Products to present advertisement content through the Roku Advertising Framework, which “is built directly into the Roku SDK” and “enables the seamless integration of video advertising into your channels.”<sup>141</sup>

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<sup>139</sup> See, e.g., <https://developer.roku.com/overview>; <https://advertising.roku.com/>; <https://www.roku.com/about/affiliate>; <https://www.roku.com/betatesting>; <https://www.roku.com/roku-powered>.

<sup>140</sup> <https://developer.roku.com/docs/developer-program/getting-started/roku-dev-prog.md>.

<sup>141</sup> <https://developer.roku.com/docs/developer-program/advertising/roku-advertising-framework.md>.

Roku additionally instructs and encourages its customers, partners, and other third parties to use the Roku Infringing Products in a manner that infringes at least one claim of the '819 Patent by instructing and encouraging its customers, partners, and other third parties to use the Roku Infringing Products to make payments using Roku's payment platform.<sup>142</sup> Roku's payment platform "provides ... an end-to-end payment process" that, when "integrat[ed] in[to] a channel, ... can provide simple, streamlined workflows that enable customers to purchase and access content with minimal interaction."<sup>143</sup> "Once customers add a method of payment to their Roku customer account, they can subscribe to channels, rent movies, and purchase sporting events and pay-per-views all directly on-device with just a few key presses from their Roku remote control."<sup>144</sup>

95. Roku further provides information and technical support on its website (*e.g.*, [www.developer.roku.com](http://www.developer.roku.com)) that instructs and encourages customers, end-users, partners, and third parties on how to use the Roku Infringing Products, and thereby induces and contributes to direct infringement by its customers, end-users, partners, and third parties.

96. In each case, the information and materials provided by Roku contain detailed descriptions and instructions for using and implementing the functionality claimed in at least Claim 184 of the '819 Patent including, at least, that Roku requires that developers "develop each of

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<sup>142</sup> See, *e.g.*, <https://developer.roku.com/docs/developer-program/roku-pay/how-roku-pay-works.md>

<sup>143</sup> *Id.*

<sup>144</sup> *Id.*

[their] Applications in accordance with all Developer Policies, utilizing either (a) Direct Publisher ..., or (b) the [Roku] SDK....”<sup>145</sup>

97. Roku requires developers to “submit [their] Application[s] to Roku for Roku’s review and approval (at Roku’s sole discretion) prior to Roku publishing (or republishing) [their] Application[s].”<sup>146</sup> Roku further requires that developers “not hide, misrepresent or obscure any features, content, services or functionality in [their] Application[s] from Roku’s review, or otherwise hinder Roku from being able to fully review [their] Application[s],” and “cooperate with Roku in its review process and provide information and materials requested by Roku to enable Roku to fully review [their] Application[s].”<sup>147</sup>

98. Roku further requires that developers “provide Roku with a sufficient number of test accounts (fully-enabled and, if applicable, fully paid) for [their] Application[s] (including, if applicable, valid log-in credentials) so that Roku can access and review all Content and Developer Services (and functions thereof) made available via [their] Application[s].”<sup>148</sup>

99. Roku further requires that all “Paid Applications must (a) use Roku Pay and not any alternate billing service, (b) refrain from directing end users to use alternative billing services, and (c) refrain from otherwise encouraging end users to purchase access to your Content other than through the Platform.”<sup>149</sup>

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<sup>145</sup> <https://docs.roku.com/published/developerdistribution/en/us>, at ¶ 9.1

<sup>146</sup> *Id.*, at ¶ 9.2.

<sup>147</sup> *Id.*

<sup>148</sup> *Id.*, at ¶9.3.

<sup>149</sup> *Id.* at Exhibit A, ¶ 3.1.

100. On information and belief, in order for a developer’s application to be approved by Roku, Roku requires that the developer follow Roku’s guidelines for application development, including using Roku’s “current APIs,” and provides a “Static Analysis tool [to] check[] the structure and syntax of [the] channel’s code for common problems related to certification requirements and list[] any errors that must be resolved before the channel can be scheduled for publishing,” and a “Channel Behavior Analysis tool,” which “launches the channel and checks for state-driven results to verify compliance with various certification criteria.”<sup>150</sup>

101. Roku additionally instructs and encourages its customers, end-users, partners, and third parties to use the Roku Infringing Products in a manner that directly infringes at least Claim 184 of the ’819 Patent, by providing instruction to its customers, end-users, partners, and third parties on its website.<sup>151</sup> For example, Roku provides a “Roku Support” website (<https://support.roku.com/>) that includes instruction on a variety of topics, including device setup,<sup>152</sup> Roku Features,<sup>153</sup> and Channels and viewing.<sup>154</sup>

**THIRD COUNT FOR RELIEF**  
**(DIRECT INFRINGEMENT OF THE ’584 PATENT)**

102. IOENGINE repeats, re-alleges, and incorporates by reference the preceding paragraphs as if fully set forth herein, including but not limited to Paragraphs 21-101.

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<sup>150</sup> <https://developer.roku.com/docs/developer-program/certification/certification.md>

<sup>151</sup> See, e.g., <https://www.roku.com/how-it-works>.

<sup>152</sup> See, e.g., <https://support.roku.com/article/208754888> (“How do I set up my Roku® streaming player or Streaming Stick® (any model)?”); <https://support.roku.com/category/115001360548> (“Roku Setup”).

<sup>153</sup> See, e.g., <https://support.roku.com/category/200889378>.

<sup>154</sup> See, e.g., <https://support.roku.com/category/4403796545175>.



103. The '584 Patent is presumed valid and Roku has had actual knowledge of the '584 Patent at least as early as the filing of this Complaint.

104. Roku is not licensed under the '584 Patent and has no other right or permission to practice the invention embodied therein.

105. On information and belief, Roku has infringed and continues to infringe, directly (alone or jointly), literally, and/or under the doctrine of equivalents, in violation of 35 U.S.C. § 271, one or more claims of the '584 Patent by performing, without authority, one or more of the following acts: making, having made, using, importing, selling, and offering for sale in the United States one or more products or services that embody the invention claimed in the '584 Patent, including but not limited to the Roku Infringing Products. Since at least after receiving notice of this Complaint, Roku has knowingly infringed, and continues to infringe, one or more claims of the '584 Patent by making, having made, using, importing, selling, and offering for sale in the United States the Roku Infringing Products, which products constitute a material part of the invention and are not staple articles or commodities of commerce suitable for substantial non-infringing use.

106. For example, the Roku Infringing Products embody the patented invention of the '584 Patent and infringe at least Claim 1 of the '584 Patent.

107. For example, each of the Roku Streaming Players is:

“A portable device configured to communicate with (i) a communications network comprising a plurality of communications network nodes and (ii) a terminal comprising a processor, an output component, and a memory configured to store program code, including first program code which, when executed by the terminal processor, is configured to facilitate a key exchange between the terminal and the portable device, the portable device comprising:

(a) a network interface configured to enable transmission of communications between the portable device and a communications network node;

(b) a communication interface configured to enable transmission of communications between the portable device and the terminal;

(c) a processor; and

(d) a memory having executable program code stored thereon, including:

(1) second program code which, when executed by the portable device processor, is configured to cause a communication to be transmitted to the terminal to display an interactive user interface by the terminal output component, the interactive user interface comprising at least one user interface element configured to be manipulated by a user to cause the portable device processor to execute stored program code;

(2) third program code which, when executed by the portable device in response to a command resulting from user manipulation of a user interface element of the interactive user interface, is configured to cause a communication to be transmitted to the terminal to affect the display of the interactive user interface by the terminal output component;

(3) fourth program code which, when executed by the portable device processor in response to a command resulting from user manipulation of a user interface element on an interactive user interface, is configured to cause a secure communication to be transmitted through the portable device network interface to a communications network node; and

(4) fifth program code which, when executed by the portable device processor, is configured to (i) process secure data received from the communications network node through the portable device network interface and (ii) cause the processed data to be securely transmitted through the communications interface to the terminal for display by the terminal output component, wherein the portable device is configured to employ a key exchange between the portable device and the terminal to securely transmit the processed data through the communication interface to the terminal.”<sup>155</sup>

108. **Direct Infringement: Roku Streaming Players.** The Roku Streaming Players

are portable devices.

109. The Roku Express streaming player is a portable device:

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<sup>155</sup>

<sup>155</sup>’584 Patent, Claim 1.



Size	Height: 0.75 in (19.0 mm)
	Width: 3.0 in (76.2 mm)
	Depth: 1.5 in (38.1 mm)
Weight	1.1 ounces (31.1 g)

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110. The Roku Express+ streaming player is a portable device:



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<https://www.roku.com/products/roku-express>.

<b>Size</b>	Height: 0.75 in (19.0 mm)
	Width: 3.0 in (76.2 mm)
	Depth: 1.5 in (38.1 mm)
<hr/>	
<b>Weight</b>	1.1 ounces (31.1 g)

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111. The Roku Express 4K streaming player is a portable device:



<b>Size</b>	Height: 0.8 in (20.8 mm)
	Width: 3.4 in (86.3 mm)
	Depth: 1.5 in (39.3 mm)
<hr/>	
<b>Weight</b>	1.6 ounces (44.6 g)

158

112. The Roku Express 4K+ streaming player is a portable device:

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157 <https://www.roku.com/products/roku-express-plus>.

158 <https://www.roku.com/products/roku-express-4k>.



Size	Height: 0.8 in (20.8 mm)	159
	Width: 3.4 in (86.3 mm)	
	Depth: 1.5 in (39.3 mm)	
<hr/>		
Weight	1.6 ounces (44.6 g)	

113. The Roku Premier streaming player is a portable device:

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<sup>159</sup> <https://www.roku.com/products/roku-express-4k-plus>.



Size	Height: 0.7 in (17.7 mm)
	Width: 3.3 in (83.8 mm)
	Depth: 1.4 in (36.8 mm)
Weight	1.3 ounces (31.1 g)

160

114. The Roku Streaming Stick+ streaming player is a portable device:



<b>Size</b>	Height: 0.8 in (20.3 mm)
	Width: 3.7 in (93.98 mm)
	Depth: 0.47 in (11.9 mm)
<b>Weight</b>	0.9 ounces (25.5 g)

161

115. The Roku Streaming Stick 4K streaming player is a portable device. *See, e.g.*, “Roku® Streaming Stick® 4K ... Powerful, portable streaming”<sup>162</sup> *See, e.g., id.*: “If you’re looking for something more powerful and portable, Roku® Streaming Stick® 4K+ features brilliant 4K picture quality and a long-range Wi-Fi® receiver for smoother streaming.”

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<sup>161</sup> <https://www.roku.com/products/streaming-stick-plus>.

<sup>162</sup> <https://www.roku.com/products/players>.



<b>Size</b>	Height: 3.7 in (94.5 mm)
	Width: 0.8 in (21.1 mm)
	Depth: 0.45 in (11.5 mm)
<b>Weight</b>	0.9 ounces (26 g)

163

116. The Roku Streaming Stick 4K+ streaming player is a portable device. *See, e.g.*, “Roku® Streaming Stick® 4K+ ... Powerful, portable streaming.”<sup>164</sup>

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<sup>163</sup> <https://www.roku.com/products/roku-streaming-stick-4k>.

<sup>164</sup> <https://www.roku.com/products/players>.





<b>Size</b>	Height: 3.7 in (94.5 mm)
	Width: 0.8 in (21.1 mm)
	Depth: 0.45 in (11.5 mm)
<hr/>	
<b>Weight</b>	0.9 ounces (26 g)

165

117. The Roku Streaming Stick+ Headphone Edition streaming player is a portable device. *See, e.g.,* “Roku® Streaming Stick®+ Headphone Edition ... High-performance portability.”<sup>166</sup>

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<sup>165</sup> <https://www.roku.com/products/roku-streaming-stick-4k-plus>.

<sup>166</sup> <https://www.roku.com/products/players>.



<b>Size</b>	Height: 3.7 in (94.5 mm)
	Width: 0.8 in (21.1 mm)
	Depth: 0.47 in (11.9 mm)
<b>Weight</b>	0.9 ounces (25.5 g)

167

118. The Roku Ultra LT streaming player is a portable device:



<b>Size</b>	Height: 1.0 in (25.4 mm)
	Width: 4.9 in (124.4 mm)
	Depth: 5.0 in (127 mm)
<hr/>	
<b>Weight</b>	5.9 ounces (167.2 g)

168

119. The Roku Ultra streaming player is a portable device:



<b>Size</b>	Height: 1.0 in (25.4 mm)
	Width: 4.9 in (124.4 mm)
	Depth : 5.0 in (127.0 mm)
<hr/>	
<b>Weight</b>	5.9 ounces (167.2 g)

169

120. The Roku Streambar streaming player is a portable device:

168 <https://www.roku.com/products/roku-ultra-lt>.

169 <https://www.roku.com/products/roku-ultra>.



<b>Size</b>	Height: 2.4 in (60.9 mm)
	Width: 14 in (355.6 mm)
	Depth: 4.2 in (106.6 mm)
<hr/>	
<b>Weight</b>	38.4 ounces (1088.6 g)

170

121. The Roku Streambar Pro streaming player is a portable device:

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<sup>170</sup> <https://www.roku.com/products/audio/roku-streambar>.



Size	Height: 2.8 in (71 mm)
	Width: 32.2 in (818 mm)
	Depth: 3.9 in (99 mm)
Weight	88 ounces (2495 g)

171

122. The Roku Smart Soundbar streaming player is a portable device:



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<sup>171</sup> <https://www.roku.com/products/audio/roku-streambar-pro>.

**Assembled Product Dimensions (L x W x H)**

3.90 x 32.20 x 2.80 Inches

172

123. On information and belief, the Roku Streaming Players are configured to communicate, *e.g.*, via WiFi or Ethernet, with a communications network comprising a plurality of communications network nodes, *e.g.*, the Internet, comprising various servers, *e.g.*, a Roku server or a server associated with other streaming video or audio providers, and to communicate, *e.g.*, via HDMI, with a terminal, such as a television, comprising a processor, an output component, such as a display, and a memory configured to store program code. *See, e.g.*, “Simply plug your Roku player into your TV with an HDMI® Cable or directly, and then follow the on-screen prompts. You’ll need to create a Roku account in order to download and stream channels.”<sup>173</sup> *See also, e.g.*, “All Roku players and streaming sticks connect to your TV’s HDMI port.”<sup>174</sup> *See, e.g., id.*: “Why do I need an Internet connection? Roku streaming players and Roku TVs need Internet access to stream content. They use wireless to connect to your home network, or you can choose a model that offers a wired Ethernet connector.”

124. The Roku Streaming Players are configured to communicate with a communications network, *e.g.*, the Internet, comprising a plurality of communications network nodes, such as a Roku server, or a server associated with other streaming video or audio providers,

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<sup>172</sup> <https://www.walmart.com/ip/onn-Roku-Smart-Soundbar-with-built-in-4K-Streaming-Media-Player/642573197>.

<sup>173</sup> <https://www.roku.com/products/players>.

<sup>174</sup> <https://www.roku.com/how-it-works>.

such as Waco City Cable Channel,<sup>175</sup> Welcome to Waco,<sup>176</sup> 25 News KXXV and KRHD,<sup>177</sup> Austin News from KVUE,<sup>178</sup> Austin News & Weather,<sup>179</sup> Austin Public,<sup>180</sup> Concertstream – Austin,<sup>181</sup> and The Roku Channel.<sup>182</sup> *See, e.g.*, “Why do I need an Internet connection? Roku streaming players and Roku TVs need Internet access to stream content. They use wireless to connect to your home network, or you can choose a model that offers a wired Ethernet connector.”<sup>183</sup> *See, e.g., id.* (describing “streaming” as “the way video and audio content is delivered over the Internet [to a Roku Streaming Player]” and that Roku Streaming Players “bring the fun and convenience of streaming to your big-screen TV”):

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<sup>175</sup> <https://channelstore.roku.com/details/85329433f23dfa4f3a65e09f93a2b794/waco-city-cable-channel>.

<sup>176</sup> <https://channelstore.roku.com/details/4f331cf3ab3a49b019315b0bfa68ff2f/welcome-to-waco>.

<sup>177</sup> <https://channelstore.roku.com/details/8d7477688c88feb9157425a1905cdb08/25-news-kxxv-and-krhd>.

<sup>178</sup> <https://channelstore.roku.com/details/88f24a75a68aef441c4b0dee518f2e8/austin-news-from-kvue>.

<sup>179</sup> <https://channelstore.roku.com/details/a96135987069487109a3eb0fd9c5d243/austin-news-and-weather>.

<sup>180</sup> <https://channelstore.roku.com/details/7d9530ac89d22f37f4d9866baba9338e/austin-public>.

<sup>181</sup> <https://channelstore.roku.com/details/037954b0aef8664b318ff977ffd666a9/concertstream-austin>.

<sup>182</sup> <https://therokuchannel.roku.com/>.

<sup>183</sup> <https://www.roku.com/how-it-works>.

### **What is streaming?**

Have you ever watched a YouTube video on your smartphone or a Netflix movie on your laptop? That's streaming. It's the way video and audio content is delivered over the Internet, and has become a popular way to watch TV.

Why? Because streaming lets you watch what you want, the moment you want to. You don't have to wait for a download to finish, your DVR to record, or the show to come on the air.

Roku products bring the fun and convenience of streaming to your big-screen TV. The choice of what to watch and what to pay for is up to you. We like to call it TV on your terms.

125. On information and belief, the Roku Streaming Players are configured to communicate, *e.g.*, via HDMI, with a terminal comprising a processor, an output component, and a memory configured to store program code, such as a television with an HDMI port. *See, e.g.*: “Note: All Roku players and streaming sticks connect to your TV’s HDMI port”<sup>184</sup> *See also, e.g.*: “Every Roku player is easy to set up .... Simply plug your Roku player into your TV with an HDMI® Cable or directly.”<sup>185</sup> *See also, e.g.*: “HDMI (High-Definition Multimedia Interface®) is the standard for connecting today’s high-definition equipment, transmitting audio, video, and communications between devices over a single connection. With one HDMI cable, you can connect a Blu-ray™ player, game console, or Roku streaming player to your TV for optimal picture and sound, and also take advantage of other HDMI features that help simplify how you set

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<sup>184</sup> <https://www.roku.com/how-it-works>.

<sup>185</sup> <https://www.roku.com/products/players>.

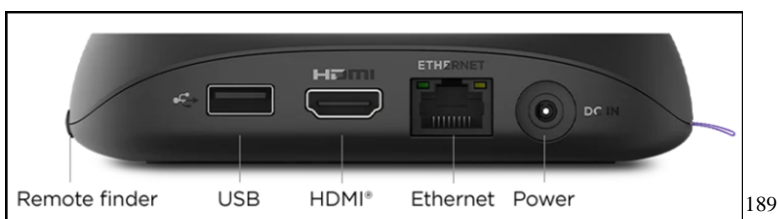


up and use your entertainment system.”<sup>186</sup> See also, e.g., “Enjoy smooth HD streaming on your TV at our best price. It’s easy to get started with the included High Speed HDMI® Cable.”<sup>187</sup>

126. For example, the Roku Streaming Player Express has an HDMI connection for a television:



127. As another example, the Roku Streaming Player Ultra has an HDMI connection for a television:



128. As another example, the Roku Streaming Player Streambar has an HDMI connection for a television:

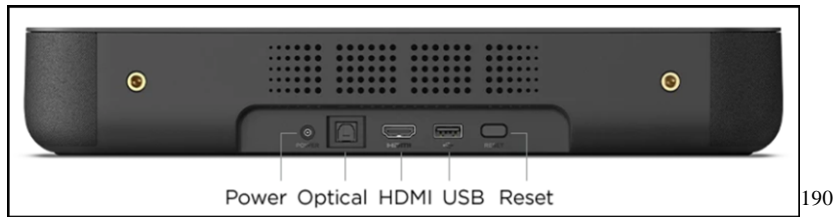
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<sup>186</sup> <https://support.roku.com/article/360033779694>.

<sup>187</sup> <https://www.roku.com/products/roku-express>.

<sup>188</sup> *Id.*

<sup>189</sup> <https://www.roku.com/products/roku-ultra>.



129. On information and belief, the Roku Streaming Players are configured to communicate with a terminal, such as a television with an HDMI port, comprising a processor, an output component, and a memory configured to store program code, including first program code which, when executed by the terminal processor, is configured to facilitate a key exchange between the television and the Roku Streaming Players. *See, e.g.*: “Roku OS also supports HDCP for content copy protection between the Roku player’s HDMI port and the connected display.”<sup>191</sup> *See, e.g.*: “The Roku OS supports High-bandwidth Digital Content Protection (HDCP) for content copy protection between the Roku player’s HDMI port and the connected display. In addition, 4K-capable Roku devices support the Trusted Execution Environment (TEE).”<sup>192</sup>

130. The Roku Streaming Players include a network interface, such as 802.11bgn, 802.11ac, and 10/100 Base-T Ethernet, configured to enable transmission of communications between the Roku Streaming Players and a communications network node, such as a Roku server, or a server associated with other streaming video or audio providers. *See, e.g.*, (Roku Express): “Networking 802.11bgn single-band wireless.”<sup>193</sup> *See, e.g.*, (Roku Express+): “Networking

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<sup>190</sup> <https://www.roku.com/products/audio/roku-streambar>.

<sup>191</sup> <https://developer.roku.com/docs/specs/media/content-protection.md#copy-protection>

<sup>192</sup> <https://developer.roku.com/docs/features/security.md>

<sup>193</sup> <https://www.roku.com/products/roku-express>.

802.11bgn single-band wireless”<sup>194</sup> *See, e.g.*, (Roku Express 4K): “Networking 802.11ac dual-band Wi-Fi® [and] Wired Ethernet requires USB adaptor (sold separately)”<sup>195</sup> *See, e.g.*, (Roku Express 4K+): “Networking 802.11ac dual-band Wi-Fi® [and] Wired Ethernet requires USB adaptor (sold separately)”<sup>196</sup> *See, e.g.*, (Roku Premiere): “Networking 802.11bgn single-band wireless”<sup>197</sup> *See, e.g.*, (Roku Streaming Stick+): “Networking 802.11ac MIMO dual-band wireless”<sup>198</sup> *See, e.g.*, (Roku Streaming Stick 4K): “Networking 802.11ac MIMO dual-band Wi-Fi®”<sup>199</sup> *See, e.g.*, (Roku Streaming Stick 4K+): “Networking 802.11ac MIMO dual-band Wi-Fi®”<sup>200</sup> *See, e.g.*, (Roku Streaming Stick+ Headphone Edition): “Networking 802.11ac MIMO dual-band Wi-Fi®”<sup>201</sup> *See, e.g.*, (Roku Ultra): “Networking 802.11ac dual-band MIMO Wi-Fi® [and] 10/100 Base-T Ethernet”<sup>202</sup> *See, e.g.*, (Roku Ultra LT): “Networking 802.11ac dual-band MIMO Wi-Fi® [and] 10/100 Base-T Ethernet”<sup>203</sup> *See, e.g.*, (Roku Streambar): “Networking 802.11ac dual-band, MIMO Wi-Fi® [and] Wired Ethernet requires USB adaptor (sold

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<sup>194</sup> <https://www.roku.com/products/roku-express-plus>.

<sup>195</sup> <https://www.roku.com/products/roku-express-4k>.

<sup>196</sup> <https://www.roku.com/products/roku-express-4k-plus>.

<sup>197</sup> <https://www.roku.com/products/roku-premiere>.

<sup>198</sup> <https://www.roku.com/products/streaming-stick-plus>.

<sup>199</sup> <https://www.roku.com/products/roku-streaming-stick-4k>.

<sup>200</sup> <https://www.roku.com/products/roku-streaming-stick-4k-plus>.

<sup>201</sup> <https://www.roku.com/products/roku-streaming-stick-plus-headphone-edition>.

<sup>202</sup> <https://www.roku.com/products/roku-ultra>.

<sup>203</sup> <https://www.roku.com/products/roku-ultra-lt>.

separately).”<sup>204</sup> *See, e.g.*, (Roku Streambar Pro): “Network 802.11ac dual-band, MIMO Wi-Fi®”<sup>205</sup>

131. The Roku Streaming Players include a communications interface, such as an HDMI interface, configured to enable the transmission of communications between the Roku Streaming Players and a terminal, such as a television. *See, e.g.*, (Roku Express): “It’s easy to get started with the included High Speed HDMI® Cable. With access to hundreds of free channels, there’s plenty to stream without spending extra.”<sup>206</sup> *See, e.g.*, (Roku Express+): “Compatibility ... Works with any TV with HDMI®”<sup>207</sup> *See, e.g.*, (Roku Express 4K): “TV Compatibility ... Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>208</sup> *See, e.g.*, (Roku Express 4K+): “TV Compatibility ... Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>209</sup> *See, e.g.*, (Roku Premiere): “TV Compatibility ... 4K UHD TVs ... TV must have an HDMI input that supports HDCP 2.2[,] 4K UHD HDR TVs ... TV must have an HDMI input that supports HDCP 2.2.”<sup>210</sup> *See, e.g.*, (Roku Streaming Stick+): “TV Compatibility ... Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>211</sup> *See, e.g.*, (Roku Streaming Stick+ Headphone Edition): “TV Compatibility ... Requires compatible

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<sup>204</sup> <https://www.roku.com/products/audio/roku-streambar>.

<sup>205</sup> <https://www.roku.com/products/audio/roku-streambar-pro>.

<sup>206</sup> <https://www.roku.com/products/roku-express>.

<sup>207</sup> <https://www.roku.com/products/roku-express-plus>.

<sup>208</sup> <https://www.roku.com/products/roku-express-4k>.

<sup>209</sup> <https://www.roku.com/products/roku-express-4k-plus>.

<sup>210</sup> <https://www.roku.com/products/roku-premiere>.

<sup>211</sup> <https://www.roku.com/products/streaming-stick-plus>.

TV with an HDMI input that supports HDCP 2.2.”<sup>212</sup> *See, e.g.*, (Roku Streaming Stick 4K): “TV Compatibility ... 4K TVs\* ... 4K HDR TVs\* ... \*Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>213</sup> *See, e.g.*, (Roku Streaming Stick 4K+): “TV Compatibility ... 4K TVs\* ... 4K HDR TVs\* ... \*Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>214</sup> *See, e.g.*, (Roku Ultra): “TV Compatibility ... 4K TVs\* ... 4K HDR TVs\* ... \*Requires compatible TV with an HDMI® input that supports HDCP 2.”<sup>215</sup> *See, e.g.*, (Roku Ultra LT): “TV Compatibility ... 4K TVs\*... 4K HDR TVs\* ... \*Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>216</sup> *See, e.g.*, (Roku Streambar): “TV Compatibility ... Requires TV with HDMI ARC or Optical outputs ... 4K TVs ... TV must have an HDMI input that supports HDCP 2.2[,] 4K HDR TVs ... TV must have an HDMI input that supports HDCP 2.2”<sup>217</sup> *See, e.g.*, (Roku Streambar Pro): “TV Compatibility ... 4K UHD TVs ... TV must have an HDMI input that supports HDCP 2.2[,] 4K UHD HDR TVs ... TV must have an HDMI input that supports HDCP 2.2 ... Requires TV with HDMI ARC or Optical outputs”<sup>218</sup> *See, e.g., id.*: “Will Roku Streambar Pro work on any TV? Yes, Roku® Streambar™ Pro will work on any TV with an HDMI® port.” *See, e.g.*, (Roku Smart Soundbar): “Super simple setup: Just plug it into your

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<sup>212</sup> <https://www.roku.com/products/roku-streaming-stick-plus-headphone-edition>.

<sup>213</sup> <https://www.roku.com/products/roku-streaming-stick-4k>.

<sup>214</sup> <https://www.roku.com/products/roku-streaming-stick-4k-plus>.

<sup>215</sup> <https://www.roku.com/products/roku-ultra>.

<sup>216</sup> <https://www.roku.com/products/roku-ultra-lt>.

<sup>217</sup> <https://www.roku.com/products/audio/roku-streambar>.

<sup>218</sup> <https://www.roku.com/products/audio/roku-streambar-pro>.

TVs HDMI-ARC port with the included Premium High-Speed HDMI® Cable and connect to the internet.”<sup>219</sup>

132. The Roku Streaming Players’ HDMI interface enables the transmission of communications between Roku Streaming Players and any television with an HDMI port. *See, e.g.*: “Your Roku streaming device can be connected to any television with an HDMI® port. To make this connection, a Roku player requires an HDMI cable while a Roku Streaming Stick connects directly with its built-in HDMI connector. When selecting an HDMI cable, we recommend that you use a High Speed HDMI Cable if your TV only supports 720p and 1080p, or a Premium High Speed HDMI Cable if your TV also supports 4K Ultra HD or HDR.”<sup>220</sup>

133. The Roku Streaming Players include a processor. For example, on information and belief, the Roku Streaming Players contain the following processors:<sup>221</sup>

Roku Streaming Player	Processor
Roku Express	ARM Cortex A53
Roku Express	MIPS 900 MHz
Roku Express+	ARM Cortex A53
Roku Express+	MIPS 900 MHz
Roku Express 4K	ARM Cortex A55
Roku Express 4K+	ARM Cortex A55
Roku Premiere	ARM Cortex A53
Roku Premiere	ARM Cortex A53 quad core 1.2 GHz
Roku Premiere+	ARM Cortex A53
Roku Premiere+	ARM Cortex A53 quad core 1.2 GHz
Roku Smart Soundbar	ARM Cortex A53
Roku Streambar	MStar C2
Roku Streambar Pro	On information and belief, the Roku Streambar Pro includes a processor configured to stream data

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<sup>219</sup> <https://www.walmart.com/ip/onn-Roku-Smart-Soundbar-with-built-in-4K-Streaming-Media-Player/642573197>.

<sup>220</sup> <https://support.roku.com/article/208754888>.

<sup>221</sup> <https://developer.roku.com/docs/specs/hardware.md>.

Roku Streaming Player	Processor
	content for presentation by the terminal output component.
Roku Streaming Stick	ARM Cortex A53
Roku Streaming Stick	ARM Cortex A7 quad core 800 MHz
Roku Streaming Stick	ARM11 600 MHz
Roku Streaming Stick+	ARM Cortex A53
Roku Streaming Stick+ Headphone Edition	On information and belief, the Roku Streaming Stick+ Headphone Edition includes a processor configured to stream data content for presentation by the terminal output component.
Roku Streaming Stick 4K	ARM Cortex A55
Roku Streaming Stick 4K+	ARM Cortex A55
Roku Ultra	ARM Cortex A53 quad core 1.2 GHz
Roku Ultra	ARM Cortex A53
Roku Ultra	ARM Cortex A55
Roku Ultra LT	ARM Cortex A53
Roku Ultra LT	ARM Cortex A55

134. The Roku Streaming Players comprise a memory having executable program code stored thereon. For example, on information and belief, Roku Streaming Players include one or more of RAM, ROM, flash memory, non-volatile memory, or other storage devices or internal or on-board memory. For example, the Roku Streaming Players include a processor which contains on-board memory. For example, the Arm Cortex A53 processor contains 128K-2048K L2 Cache, and four cores, each with 8K-64K L1 Instruction Cache, and 8K-64K L1 Data Cache.<sup>222</sup> For example, on information and belief, the Roku Streaming Players also include onboard RAM. *See, e.g.*<sup>223</sup>

Roku Streaming Player	CPU	RAM
Roku Express	ARM Cortex A53	512 MB
Roku Express	MIPS 900 MHz	512 MB
Roku Express+	ARM Cortex A53	512 MB

<sup>222</sup> <https://developer.arm.com/ip-products/processors/cortex-a/cortex-a53>.

<sup>223</sup> <https://developer.roku.com/docs/specs/hardware.md>.

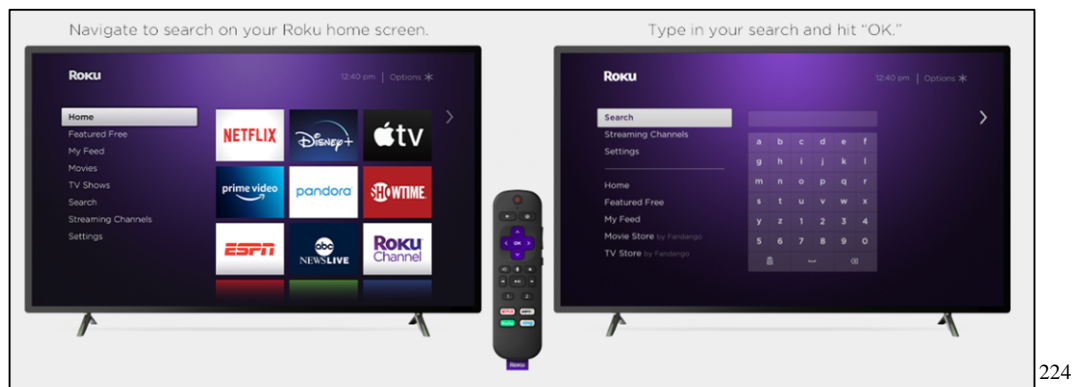
Roku Express+	MIPS 900 MHz	512 MB
Roku Express 4K	ARM Cortex A55	1 GB
Roku Express 4K+	ARM Cortex A55	1 GB
Roku Premiere	ARM Cortex A53	1 GB
Roku Premiere	ARM Cortex A53 quad core 1.2 GHz	1 GB
Roku Premiere+	ARM Cortex A53	1 GB MB
Roku Premiere+	ARM Cortex A53 quad core 1.2 GHz	1 GB
Roku Smart Soundbar	ARM Cortex A53	1 GB MB
Roku Streambar	MStar C2	1 GB
Roku Streambar Pro	On information and belief, the Roku Streambar Pro includes memory having executable program code stored thereon.	
Roku Streaming Stick	ARM Cortex A53	512 MB
Roku Streaming Stick	ARM Cortex A7 quad core 800 MHz	512 MB
Roku Streaming Stick	ARM11 600 MHz	256 MB
Roku Streaming Stick	ARM11 600 MHz	512 MB
Roku Streaming Stick+	ARM Cortex A53	1 GB
Roku Streaming Stick+ Headphone Edition	On information and belief, the Roku Streaming Stick+ Headphone Edition includes memory having executable program code stored thereon.	
Roku Streaming Stick 4K	ARM Cortex A55	1 GB
Roku Streaming Stick 4K+	ARM Cortex A55	1 GB
Roku Ultra	ARM Cortex A53 quad core 1.2 GHz	1 GB
Roku Ultra	ARM Cortex A53	1 GB
Roku Ultra	ARM Cortex A53	2 GB
Roku Ultra	ARM Cortex A55	2 GB
Roku Ultra LT	ARM Cortex A53	1 GB
Roku Ultra LT	ARM Cortex A55	2 GB

135. Additionally, the Roku Streaming Players store program code, for example, the Roku OS, on the processor's on-board memory and/or RAM, ROM, flash memory, non-volatile memory, or other storage devices or internal or on-board memory.

136. On information and belief, program code stored on the Roku Streaming Players' memory, when executed by the Roku Streaming Players' processors, is configured to cause a communication to be transmitted to the television to display an interactive user interface, such as the Roku graphical user interface or the graphical user interface of streaming video or audio



providers, comprising at least one user interface element configured to be manipulated by a user to cause the Roku Streaming Players' processors to execute stored program code. *See, e.g.:*



137. For example, program code stored on the memory of the Roku Streaming Players, when executed by the Roku Streaming Players' processors, causes a communication to be transmitted to a television to display the Roku graphical user interface or the graphical user interface of streaming video or audio providers, which is an interactive user interface with user interface elements configured to be manipulated by the user using a Roku Streaming Player to cause the Roku Streaming Players' processors to execute stored program code.

138. For example, a user can manipulate a user interface element of the Roku graphical user interface by pressing the navigation, OK, arrows and/or other buttons on a Roku remote control to, for example, on information and belief, cause the Roku Streaming Players' processors to execute stored program code to search for entertainment choices. *See, e.g.:* "Search using the on-screen keyboard [-] After pressing the Home button ... on your Roku remote, navigate up or down and select Search. Start typing the first few letters of the movie, TV show, actor, director, genre, or channel, and Roku Search will update the results as you complete the word or phrase.

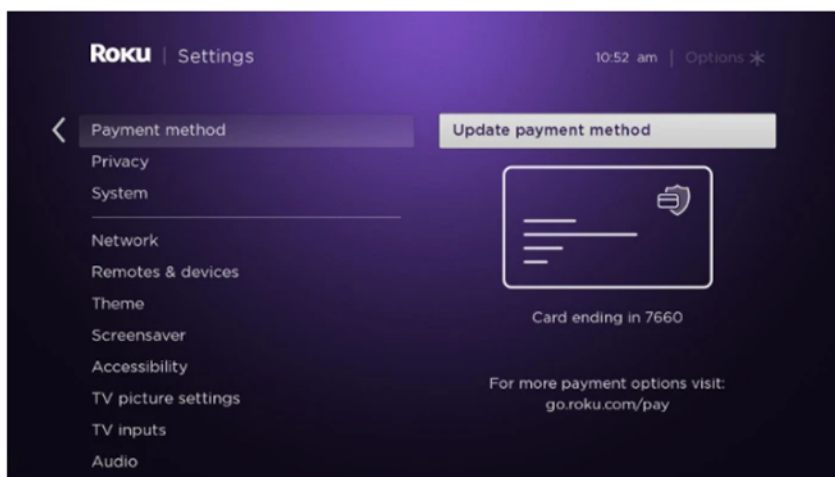
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224 <https://www.roku.com/how-it-works>.

When you find the entertainment choice or channel you are looking for, select the entry to see more details including viewing options.”<sup>225</sup> *See, e.g., id.*: “To find specific content or see related choices, you can search by title, actor, or director. When you want to browse a wider range of content, you can search for popular genres like ‘Comedy’ or ‘Action’ to see Roku Zones with a variety of categories that may include free offerings, subscription content, on-demand titles, 4K movies and shows, and more.”

139. As another example, the Roku graphical user interface comprises at least one user interface element, such as for updating payment methods, configured to be manipulated by a user to, on information and belief, cause the Roku Streaming Players’ processors to execute stored program code to update payment methods. *See, e.g.*:

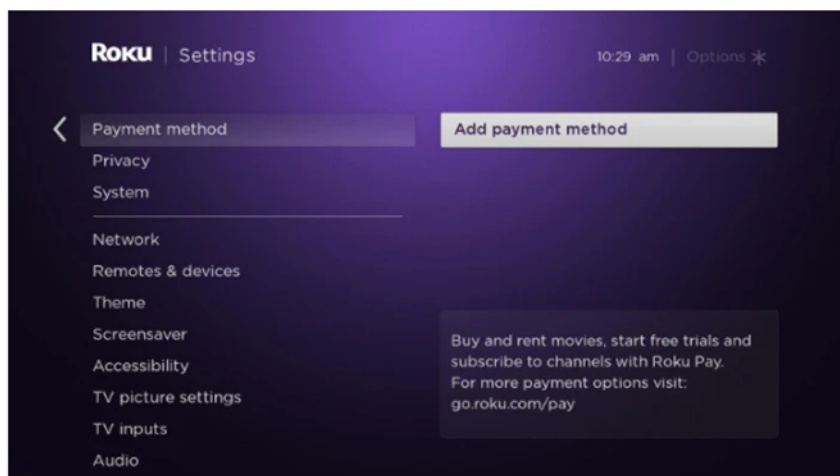
- a. **Update payment method.** Update your existing credit card information, such as expiration date.



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<sup>225</sup> <https://support.roku.com/article/208756398>.

- b. **Add payment method.** Add a new credit card to Roku account.



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140. On information and belief, program code stored on the Roku Streaming Players' memory, when executed by the Roku Streaming Players in response to a command resulting from user manipulation of a user interface element of the interactive user interface, such as the Roku graphical user interface, is configured to cause a communication to be transmitted to the television to affect the display of the interactive user interface by the television. *See, e.g.*: "Just like your smartphone has an 'app store' for installing new applications, you can access the Roku Channel Store on your Roku® streaming player or Roku TV™ to add new 'channels.' ... You can search the Channel Store on your Roku device ... to find free movies and TV shows."<sup>227</sup> *See also, e.g., id.*: "Finding free channels using the Channel Store on your Roku device[.]

1. Press the Home button ... on your Roku remote.

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<sup>226</sup> <https://support.roku.com/article/208755978>.

<sup>227</sup> <https://support.roku.com/article/208756428>.

2. Scroll up or down and select Streaming Channels to open the Channel Store.
3. Select Top Free to view the most popular free channels.
4. Choose a channel and press the OK button ... to view more options.
5. To install the channel, select Add channel.

Once downloaded, new channels are added to the list of channels under Home on the main screen of your Roku device. Scroll down and you will see your new channel at the bottom of your list of channels. If you prefer, the channel can be moved higher in the list.”

141. As another example, on information and belief, program code stored on the Roku Streaming Players’ memory, when executed by the Roku Streaming Players in response to a command resulting from user manipulation of a user interface element of the Roku graphical user interface elements is configured to cause a communication to be transmitted to the television to affect the display of the interactive user interface by the television by switching between channels and selecting shows to watch. *See, e.g., id.:* “The Live TV Channel Guide available in The Roku Channel and on the Home screen of your Roku TV provides a convenient way for you to discover and watch free, live movies, news, and TV shows. Easily browse the channel guide, select shows to watch, and quickly switch between channels like you do with a traditional TV guide. You can also quickly change the view of the channel guide to display all channels, recent channels, or favorite channels.”

142. As another example, on information and belief, program code stored on the Roku Streaming Players’ memory, when executed by the Roku Streaming Players in response to a command resulting from user manipulation of a user interface element of the Roku graphical user interface elements is configured to cause a communication to be transmitted to the television to affect the display of the interactive user interface by the television, such as to browse and watch

video content from providers such as Waco City Cable Channel,<sup>228</sup> Welcome to Waco,<sup>229</sup> 25 News KXXV and KRHD,<sup>230</sup> Austin News from KVUE,<sup>231</sup> Austin News & Weather,<sup>232</sup> Austin Public,<sup>233</sup> Concertstream – Austin,<sup>234</sup> and The Roku Channel.<sup>235</sup> As another example, on information and belief, program code stored on the Roku Streaming Players’ memory, when executed by the Roku Streaming Players in response to a command resulting from user manipulation of a user interface element of the Roku graphical user interface elements is configured to cause a communication to be transmitted to the television to affect the display of the interactive user interface by the television by navigating on the home screen to search for content.. *See, e.g.:* “[n]avigate to search on your Roku home screen” or to “[t]ype in your search and hit ‘OK’.”<sup>236</sup> *See also, id.:*

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<sup>228</sup> <https://channelstore.roku.com/details/85329433f23dfa4f3a65e09f93a2b794/waco-city-cable-channel>.

<sup>229</sup> <https://channelstore.roku.com/details/4f331cf3ab3a49b019315b0bfa68ff2f/welcome-to-waco>.

<sup>230</sup> <https://channelstore.roku.com/details/8d7477688c88feb9157425a1905cdb08/25-news-kxxv-and-krhd>.

<sup>231</sup> <https://channelstore.roku.com/details/88f24a75a68aef441c4b0dee518f2e8/austin-news-from-kvue>.

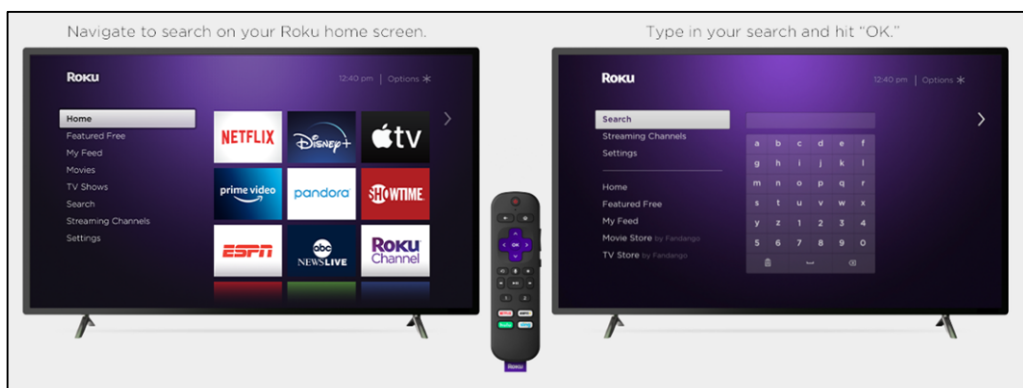
<sup>232</sup> <https://channelstore.roku.com/details/a96135987069487109a3eb0fd9c5d243/austin-news-and-weather>.

<sup>233</sup> <https://channelstore.roku.com/details/7d9530ac89d22f37f4d9866baba9338e/austin-public>.

<sup>234</sup> <https://channelstore.roku.com/details/037954b0aef8664b318ff977ffd666a9/concertstream-austin>.

<sup>235</sup> <https://therokuchannel.roku.com/>.

<sup>236</sup> <https://www.roku.com/how-it-works>



143. As another example, on information and belief, program code stored on the Roku Streaming Players' memory, when executed by the Roku Streaming Players in response to a command resulting from user manipulation of a user interface element of the Roku graphical user interface elements is configured to cause a communication to be transmitted to the television to affect the display of the interactive user interface by the television by selecting content available on a Roku server, or a server associated with other streaming video or audio providers. *See, e.g.:* "Search using the on-screen keyboard [-] After pressing the Home button ... on your Roku remote, navigate up or down and select Search. Start typing the first few letters of the movie, TV show, actor, director, genre, or channel, and Roku Search will update the results as you complete the word or phrase. When you find the entertainment choice or channel you are looking for, select the entry to see more details including viewing options."<sup>237</sup>

144. On information and belief, program code stored in memory of the Roku Streaming Players, when executed by the Roku Streaming Players' processors in response to a command resulting from user manipulation of a user interface element on an interactive user interface, such as the Roku graphical user interface, or the graphical user interface of streaming video or audio

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<sup>237</sup> <https://support.roku.com/article/208756398>

providers, is configured to cause a secure communication to be transmitted through the Roku Streaming Players' network interface to a communications network node, such as a Roku server, or a server associated with other streaming video or audio providers, on the Internet. *See, e.g.:* "Your Roku® streaming player or Roku TV™ provides you with access to stream audio and video from the internet. For this to work, your Roku device must maintain a good connection to your network and the internet."<sup>238</sup> *See, e.g.:* "When you turn on your Roku streaming player or Roku TV™ for the first time, your device will automatically prompt you to establish a connection to the internet over Wi-Fi or Ethernet cable. It is important that a connection between your Roku device, your home network, and the internet is established in order to stream audio and video."<sup>239</sup> *See, e.g.:* "SSL is the primary method provided for developers to implement content and/or communications security for their application. The device supports both client and server authentication via SSL to provide a secure communications channel between trusted endpoints."<sup>240</sup>

145. On information and belief, program code stored in memory of the Roku Streaming Players, when executed by the Roku Streaming Players' processors in response to a command resulting from user manipulation of a user interface element on an interactive user interface, such as the Roku graphical user interface, or the graphical user interface of streaming video or audio providers, is configured to cause a secure communication to be transmitted through the Roku Streaming Players' network interface to a communications network node, such as a Roku server,

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<sup>238</sup> <https://support.roku.com/article/115015678567>.

<sup>239</sup> <https://support.roku.com/article/115015760328>.

<sup>240</sup> <https://developer.roku.com/docs/features/security.md>.

or a server associated with other streaming video or audio providers. *See, e.g.*: “Roku devices are designed to play a variety of streaming content directly from the Internet. We understand that this content is valuable to the content owners and must be protected from unauthorized access to prevent both casual and professional copying and distribution. Multiple types of security provisions are available if needed.”<sup>241</sup> *See, e.g.*: “Search by title, actor, or director using your Roku remote ... or voice search. Roku Search will tell you where your content is available for free or show you results across top channels ranked by price”<sup>242</sup> *See, e.g., id.*: “What can I watch? Stream top free or paid programming from services,” and “[t]housands more channels for sports, news, international, and kids programming plus broadcast channels ... and major music services ... are available.”

146. For example, when a user interacts with the Roku interactive user interface to select a movie/program for viewing, on information and belief the Roku Streaming Players’ processors execute program code to cause a secure communication to be transmitted through the Roku Streaming Players’ network interface to the content host server.<sup>243</sup>

147. As an additional example: A user may interact with the Roku Streaming Players’ “[o]n-screen setup and activation” graphical user interface to set up WiFi access to the user’s LAN and to the Internet. When the user selects a WiFi network and enters the associated password on the Roku on-screen setup and activation user interface, on information and belief, the Roku Streaming Players’ processors execute program code to cause a secure communication

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<sup>241</sup> <https://developer.roku.com/docs/features/security.md>

<sup>242</sup> <https://www.roku.com/how-it-works>.

<sup>243</sup> <https://support.roku.com/article/360036652634>.



to be transmitted to the Roku server to check for software updates. *See, e.g.*: “Choose your wireless network from the list of available networks and enter your password. This is most often the same network you use to connect your computer or smartphone to the internet. ... If you want to see your password as you type, choose Show password. This can help prevent entering the wrong password. ... Once you enter your password and select Connect, your Roku device automatically connects to the internet. You can get more help if you are unable to connect to your wireless network. ... Once connected to the internet, your Roku device checks for an available software update, downloads the latest version if necessary, and then reboots.”<sup>244</sup>

148. As an additional example: A user may interact with the Guided Setup interactive user interface to activate the Roku Streaming Players. When the user enters an email address in the Guided Setup interactive user interface, on information and belief, the Roku Streaming Players’ processors execute program code to cause a secure communication to be transmitted to the Roku server. *See, e.g.*, “Once you have followed the hardware setup instructions included in the Quick Start Guide that came with your Roku device, you are ready to follow the on-screen setup and activation known as Guided Setup. During Guided Setup, you will be prompted to enter an email address to begin the activation process. ... Use your computer or smartphone to access your inbox and locate the email from Roku with the activation link.”<sup>245</sup>

149. As an additional example: A user may interact with the Roku interactive user interface to add a channel (*e.g.*, Austin News & Weather<sup>246</sup>) to the Roku Streaming Players. When

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<sup>244</sup> <https://support.roku.com/article/208754888>.

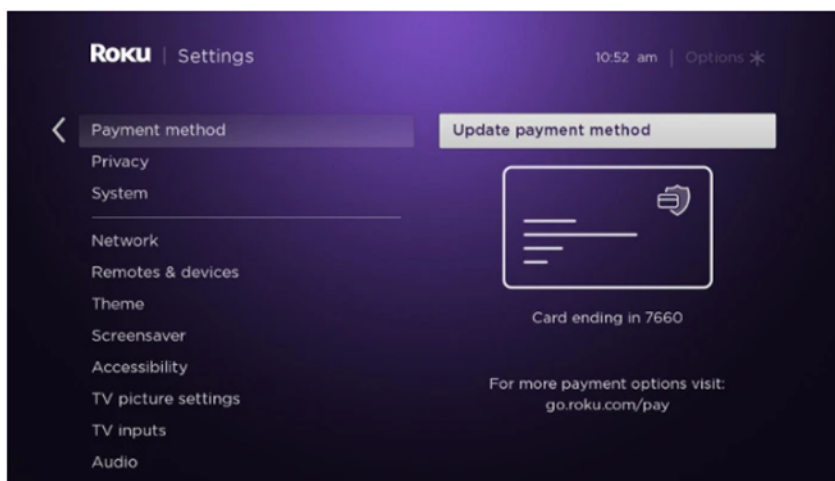
<sup>245</sup> <https://support.roku.com/article/235180868>.

<sup>246</sup> <https://channelstore.roku.com/details/a96135987069487109a3eb0fd9c5d243/austin-news-and-weather>.

the user selects the “Add channel” button on the Roku Home interactive user interface, on information and belief the Roku Streaming Players’ processors execute program code to cause a secure communication to be transmitted to the Roku server. *See, e.g.:* “The page will also contain an “Add channel” button, which will automatically add the channel to your homescreen. You may be asked to enter your billing password if the channel costs money.”<sup>247</sup>

150. As an additional example: A user may interact with the Roku Home interactive user interface to update/add a payment method linked to the user’s Roku account. When the user clicks the Update payment method button, enters the credit card information, and clicks the Save card button, on information and belief the Roku Streaming Players’ processors execute program code to cause a secure communication to be transmitted to the Roku server to update the user’s account profile. *See, e.g.:*

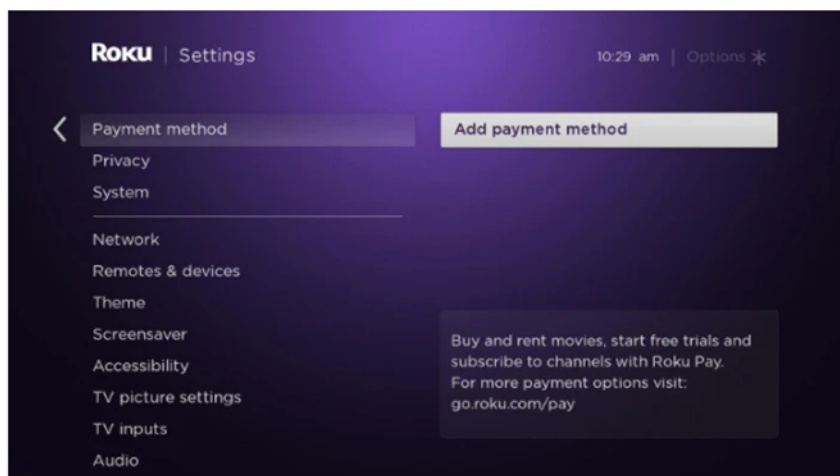
- a. **Update payment method.** Update your existing credit card information, such as expiration date.



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<sup>247</sup> <https://developer.roku.com/docs/features/engagement/channel-store.md>.

- b. **Add payment method.** Add a new credit card to Roku account.



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151. As an additional example: A user may interact with the Roku Home interactive user interface to check for Roku Streaming Player software/firmware updates. When the user selects the Check Now button, on information and belief the Roku Streaming Players’ processors execute program code to cause a secure communication to be transmitted to the Roku account server. *See, e.g.:* “Select Check Now to manually check for updates[.] If there is new software available or there are updates for your channels, then your Roku device will download and install them automatically and once completed, your Roku device will reboot.”<sup>249</sup>

152. On information and belief, the Roku Streaming Players include program code stored on internal memory that, when executed by the Roku Streaming Players’ processors, is configured to process secure data received from a Roku server, or a server associated with other

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<sup>248</sup> <https://support.roku.com/article/208755978>.

<sup>249</sup> <https://support.roku.com/article/208755668>.

streaming video or audio providers, through the Roku Streaming Players' network interface. For example, on information and belief, the Roku Streaming Players employ a secure communication protocol to securely communicate with a Roku server, or a server associated with other streaming video or audio providers. *See, e.g.*: "Security on the Roku platform The Roku Platform is designed to protect each channel's intellectual property, while ensuring the audience is safe from malicious attacks. Roku devices are designed to play a variety of streaming content directly from the Internet. We understand that this content is valuable to the content owners and must be protected from unauthorized access to prevent both casual and professional copying and distribution. Multiple types of security provisions are available if needed."<sup>250</sup>

153. As an additional example, the Roku Streaming Players are configured at the Roku factory to employ a secure communication protocol. *See, e.g., id.*: "System security The Roku platform has been designed to be hardened against unauthorized attack. This process starts at the Roku factory as each system is individualized and uniquely keyed as a foundation for robust security. The platform supports a secure key store and hardware encryption engine. The core set of system software has been encrypted and is protected by a secure boot process and the use of signed binaries. SSL is the primary method provided for developers to implement content and/or communications security for their application. The device supports both client and server authentication via SSL to provide a secure communications channel between trusted end-points."

154. On information and belief, the Roku Streaming Players include program code stored on internal memory that, when executed by the Roku Streaming Players' processors, is configured to cause the processed data received from a Roku server, or a server associated with

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<sup>250</sup> <https://developer.roku.com/docs/features/security.md>.

other streaming video or audio providers through the Roku Streaming Players' network interface, to be securely transmitted through the HDMI interface to the television for display, where the Roku Streaming Player is configured to employ a key exchange between the Roku Streaming Player and the television to securely transmit the processed data through the HDMI interface to the television. *See, e.g.:* "The Roku OS supports High-bandwidth Digital Content Protection (HDCP) for content copy protection between the Roku player's HDMI port and the connected display. In addition, 4K-capable Roku devices support the Trusted Execution Environment (TEE)."<sup>251</sup> *See also, e.g.:* "Roku OS also supports HDCP for content copy protection between the Roku player's HDMI port and the connected display."<sup>252</sup> *See, e.g.:* "The Roku OS supports High-bandwidth Digital Content Protection (HDCP) for content copy protection between the Roku player's HDMI port and the connected display. In addition, 4K-capable Roku devices support the Trusted Execution Environment (TEE)."<sup>253</sup> *See also, e.g.:* "A Roku player is a device that lets you easily enjoy the internet on your TV, which is called "streaming." You can stream channels ... on the big screen, plus get access to 500,000+ movies and TV episodes across thousands of free and paid channels. You can even sign into network TV channels with your cable login and use your Roku player as an extra cable box to save on monthly bills."<sup>254</sup> *See, e.g.:* "All Roku players and streaming sticks connect to your TV's HDMI port."<sup>255</sup>

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<sup>251</sup> <https://developer.roku.com/docs/features/security.md>.

<sup>252</sup> <https://developer.roku.com/docs/specs/media/content-protection.md#copy-protection>

<sup>253</sup> <https://developer.roku.com/docs/features/security.md>

<sup>254</sup> <https://www.roku.com/products/players>.

<sup>255</sup> <https://www.roku.com/how-it-works>.

155. On information and belief, the Roku Streaming Players are configured to employ a key exchange between the Roku Streaming Players and a terminal, such as a television with an HDMI port, to securely transmit processed data through the communication interface, such as an HDMI interface, to the television comprising high-bandwidth digital content protection protocol. *See, e.g.*: “Roku OS also supports HDCP for content copy protection between the Roku player's HDMI port and the connected display.”<sup>256</sup> *See, e.g.*: “The Roku OS supports High-bandwidth Digital Content Protection (HDCP) for content copy protection between the Roku player's HDMI port and the connected display. In addition, 4K-capable Roku devices support the Trusted Execution Environment (TEE).”<sup>257</sup> *See also, e.g.*: “A Roku player is a device that lets you easily enjoy the internet on your TV, which is called “streaming.” You can stream channels ... on the big screen, plus get access to 500,000+ movies and TV episodes across thousands of free and paid channels. You can even sign into network TV channels with your cable login and use your Roku player as an extra cable box to save on monthly bills.”<sup>258</sup> *See, e.g.*: “All Roku players and streaming sticks connect to your TV’s HDMI port.”<sup>259</sup>

156. As an additional example, the Roku Streaming Players include a communications interface, wherein the communications interface comprises a video interface connection, such as an HDMI interface, configured to enable the transmission of communications between the Roku Streaming Players and a terminal, such as a television. *See, e.g.*, (Roku Express): “It’s easy to

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<sup>256</sup> <https://developer.roku.com/docs/specs/media/content-protection.md#copy-protection>

<sup>257</sup> <https://developer.roku.com/docs/features/security.md>

<sup>258</sup> <https://www.roku.com/products/players>.

<sup>259</sup> <https://www.roku.com/how-it-works>.

get started with the included High Speed HDMI® Cable. With access to hundreds of free channels, there's plenty to stream without spending extra.”<sup>260</sup> *See, e.g.*, (Roku Express+): “Compatibility ... Works with any TV with HDMI®”<sup>261</sup> *See, e.g.*, (Roku Express 4K): “TV Compatibility ... Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>262</sup> *See, e.g.*, (Roku Express 4K+): “TV Compatibility ... Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>263</sup> *See, e.g.*, (Roku Premiere): “TV Compatibility ... 4K UHD TVs ... TV must have an HDMI input that supports HDCP 2.2[,] 4K UHD HDR TVs ... TV must have an HDMI input that supports HDCP 2.2.”<sup>264</sup> *See, e.g.*, (Roku Streaming Stick+): “TV Compatibility ... Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>265</sup> *See, e.g.*, (Roku Streaming Stick+ Headphone Edition): “TV Compatibility ... Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>266</sup> *See, e.g.*, (Roku Streaming Stick 4K): “TV Compatibility ... 4K TVs\* ... 4K HDR TVs\* ... \*Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>267</sup> *See, e.g.*, (Roku Streaming Stick 4K+): “TV Compatibility ... 4K TVs\* ... 4K HDR TVs\* ... \*Requires compatible TV with an HDMI input that supports HDCP

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<sup>260</sup> <https://www.roku.com/products/roku-express>.

<sup>261</sup> <https://www.roku.com/products/roku-express-plus>.

<sup>262</sup> <https://www.roku.com/products/roku-express-4k>.

<sup>263</sup> <https://www.roku.com/products/roku-express-4k-plus>.

<sup>264</sup> <https://www.roku.com/products/roku-premiere>.

<sup>265</sup> <https://www.roku.com/products/streaming-stick-plus>.

<sup>266</sup> <https://www.roku.com/products/roku-streaming-stick-plus-headphone-edition>.

<sup>267</sup> <https://www.roku.com/products/roku-streaming-stick-4k>.

2.2.”<sup>268</sup> *See, e.g.,* (Roku Ultra): “TV Compatibility ... 4K TVs\* ... 4K HDR TVs\* ... \*Requires compatible TV with an HDMI® input that supports HDCP 2.”<sup>269</sup> *See, e.g.,* (Roku Ultra LT): “TV Compatibility ... 4K TVs\*... 4K HDR TVs\* ... \*Requires compatible TV with an HDMI input that supports HDCP 2.2.”<sup>270</sup> *See, e.g.,* (Roku Streambar): “TV Compatibility ... Requires TV with HDMI ARC or Optical outputs ... 4K TVs ... TV must have an HDMI input that supports HDCP 2.2[,] 4K HDR TVs ... TV must have an HDMI input that supports HDCP 2.2”<sup>271</sup> *See, e.g.,* (Roku Streambar Pro): “TV Compatibility ... 4K UHD TVs ... TV must have an HDMI input that supports HDCP 2.2[,] 4K UHD HDR TVs ... TV must have an HDMI input that supports HDCP 2.2 ... Requires TV with HDMI ARC or Optical outputs”<sup>272</sup> *See, e.g., id.:* “Will Roku Streambar Pro work on any TV? Yes, Roku® Streambar™ Pro will work on any TV with an HDMI® port.” *See, e.g.,* (Roku Smart Soundbar): “Super simple setup: Just plug it into your TVs HDMI-ARC port with the included Premium High-Speed HDMI® Cable and connect to the internet.”<sup>273</sup>

157. As another example, on information and belief, the Roku Streaming Players include program code stored on internal memory that, when executed by the Roku Streaming Players, is configured to process secure data received from a Roku server, or a server associated

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<sup>268</sup> <https://www.roku.com/products/roku-streaming-stick-4k-plus>.

<sup>269</sup> <https://www.roku.com/products/roku-ultra>.

<sup>270</sup> <https://www.roku.com/products/roku-ultra-lt>.

<sup>271</sup> <https://www.roku.com/products/audio/roku-streambar>.

<sup>272</sup> <https://www.roku.com/products/audio/roku-streambar-pro>.

<sup>273</sup> <https://www.walmart.com/ip/onnn-Roku-Smart-Soundbar-with-built-in-4K-Streaming-Media-Player/642573197>.



with other streaming audio providers, such as Concertstream – Austin,<sup>274</sup> through the Roku Streaming Players’ network interface for secure transmission, *e.g.*, via the Roku Streaming Players’ HDMI interface, to the television for display by the television’s speakers or audio output, *e.g.*, streaming audio content. *See, e.g.*: “Along with watching movies and TV shows on your Roku streaming player or Roku TV™, you can also listen to music, radio stations, podcasts, and more from popular streaming services.”<sup>275</sup> *See, e.g., id.*: “Many great music channels are available on your Roku device offering a wide variety of audio content. You can listen to top tracks from your favorite artists, radio stations from across the globe, trending podcasts, the latest news, and more.”

158. As another example, on information and belief, the Roku Streaming Players include program code stored on internal memory that, when executed by the Roku Streaming Players, is configured to process live data streams received from a Roku server, or a server associated with other streaming video or audio providers, such as Austin News from KVUE,<sup>276</sup> through the Roku Streaming Players’ network interface for transmission, and securely transmits a live data stream, *e.g.*, via the Roku Streaming Players’ HDMI interface, to the television for display by the television’s display and/or speakers, *e.g.*, live video or audio content. *See, e.g.*: “We get it, TV lovers—cutting the cord is a big step. For decades, the cable box was an important member of many households. However, with the plethora of streaming options now available, it’s never been easier to kick that cable box to the curb and make the switch to live TV streaming

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<sup>274</sup> <https://channelstore.roku.com/details/037954b0aef8664b318ff977ffd666a9/concertstream-austin>.

<sup>275</sup> <https://support.roku.com/article/360009670653>.

<sup>276</sup> <https://channelstore.roku.com/details/88f24a75a68aaef441c4b0dee518f2e8/austin-news-from-kvue>.

with Roku devices.”<sup>277</sup> See also, e.g., “Stay up-to-date with the latest news and weather in the Austin area on the all-new KVUE News channel from KVUE. Our channel features the latest breaking news that impacts you and your family, weather and live video from our newscasts and local events.”<sup>278</sup>

159. As an additional example, on information and belief, program code stored in memory of the Roku Streaming Players, which, when executed by the Roku Streaming Players’ processors in response to a command resulting from a user manipulation of a user interface element on an interactive user interface, such as the Roku graphical user interface, or the graphical user interface of streaming video or audio providers, is configured to cause a secure communication to be transmitted through the Roku Streaming Players’ network interface to a communications network node to facilitate a payment transaction. See, e.g.: “What is Roku® Pay? Roku Pay lets you make purchases directly from your Roku streaming device. If you added a payment method while activating your device, you can begin using Roku Pay right away. Otherwise, you can add a payment method to get started. Adding or changing your payment method will not result in charges to your account unless you have taken additional steps such as signing up for a subscription.”<sup>279</sup>

160. By infringing the ’584 Patent, Roku has caused and will continue to cause Plaintiff IOENGINE to suffer damages in an amount to be determined at trial, *i.e.* in an amount that cannot be less than would constitute a reasonable royalty for the use of the patented technology, together with pre-judgment and post-judgment interest thereon.

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<sup>277</sup> <https://www.roku.com/blog/cable-alternatives>.

<sup>278</sup> <https://channelstore.roku.com/details/88f24a75a68aaef441c4b0dee518f2e8/austin-news-from-kvue>.

<sup>279</sup> <https://support.roku.com/article/360021144894>.

161. To the extent that Roku has continued or continues to make, have made, use, import, sell, or offer for sale products or services that infringe the '584 Patent following its awareness of the '584 Patent, Roku's infringement is willful and entitles IOENGINE to an award of enhanced damages pursuant to 35 U.S.C. § 284 and attorneys' fees pursuant to 35 U.S.C. § 285.

**FOURTH COUNT FOR RELIEF**  
**(INDIRECT INFRINGEMENT OF THE '584 PATENT)**

162. IOENGINE repeats, re-alleges, and incorporates by reference the preceding paragraphs as if fully set forth herein, including but not limited to Paragraphs 21-161.

163. On information and belief, Roku has infringed and continues to infringe indirectly by way of inducement and contributory infringement, literally and/or under the doctrine of equivalents, in violation of 35 U.S.C. § 271, one or more claims of the '584 Patent by performing, without authority, one or more of the following acts: making, having made, using, importing, selling, and offering for sale in the United States one or more products or services that embody the invention claimed in the '584 Patent, including but not limited to the Roku Infringing Products, and encouraging and instructing its customers, end-users, partners, and third parties to use the Roku Infringing Products in a manner that directly infringes the '584 Patent. Roku additionally contributes to and induces direct infringement by its customers, end-users, partners, and other third parties by instructing and encouraging them to use the Roku Infringing Products in a manner that directly infringes at least one claim of the '584 Patent, including by streaming video and audio from services such as Waco City Cable Channel,<sup>280</sup> Welcome to Waco,<sup>281</sup> 25 News KXXV and

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<sup>280</sup> <https://channelstore.roku.com/details/85329433f23dfa4f3a65e09f93a2b794/waco-city-cable-channel>.

<sup>281</sup> <https://channelstore.roku.com/details/4f331cf3ab3a49b019315b0bfa68ff2f/welcome-to-waco>.

KRHD,<sup>282</sup> Austin News from KVUE,<sup>283</sup> Austin News & Weather,<sup>284</sup> Austin Public,<sup>285</sup> Concertstream – Austin,<sup>286</sup> and The Roku Channel.<sup>287</sup>

164. Since at least after receiving notice of this Complaint, Roku has knowingly contributed to the direct infringement of and induced direct infringement of, and continues to knowingly contribute to the direct infringement of and induce direct infringement of, one or more claims of the '584 Patent by its customers, end-users, partners, and third parties with specific intent that the Roku Infringing Products be used by its customers, end-users, partners, and third parties to directly infringe the '584 Patent, which products constitute a material part of the invention and are not staple articles or commodities of commerce suitable for substantial non-infringing use.

165. Roku instructs and encourages its customers, end-users, partners, and third parties to configure and to use the Roku Infringing Products in a manner that directly infringes at least Claim 1 of the '584 Patent, including to stream video and audio.

166. In addition, Roku provides software development kits that allow, instruct, and encourage customers, end-users, partners (including, but not limited to, developers, advertisers, affiliates, beta testers, and service providers<sup>288</sup>), and other third parties to use the Roku Infringing

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<sup>282</sup> <https://channelstore.roku.com/details/8d7477688c88feb9157425a1905cdb08/25-news-kxxv-and-krhd>.

<sup>283</sup> <https://channelstore.roku.com/details/88f24a75a68aaef441c4b0dee518f2e8/austin-news-from-kvue>.

<sup>284</sup> <https://channelstore.roku.com/details/a96135987069487109a3eb0fd9c5d243/austin-news-and-weather>.

<sup>285</sup> <https://channelstore.roku.com/details/7d9530ac89d22f37f4d9866baba9338e/austin-public>.

<sup>286</sup> <https://channelstore.roku.com/details/037954b0aef8664b318ff977ffd666a9/concertstream-austin>.

<sup>287</sup> <https://therokuchannel.roku.com/>.

<sup>288</sup> *See, e.g.*, <https://developer.roku.com/overview>; <https://advertising.roku.com/>; <https://www.roku.com/about/affiliate>; <https://www.roku.com/betatesting>; <https://www.roku.com/roku-powered>.

Products in a manner that infringes at least one claim of each of the Patents-in-Suit, including by providing “an open streaming platform,” on which “Roku welcomes publishers and developers to grow their audience with Roku.”<sup>289</sup> Roku further instructs and encourages the infringing use of the Roku Infringing Products by maintaining a Roku Developers website which offers courses, demonstrations, a knowledge center, and developer tools and forums. *See, also, id.* Roku also instructs and encourages the infringing use of the Roku Infringing Products to present advertisement content through the Roku Advertising Framework, which “is built directly into the Roku SDK” and “enables the seamless integration of video advertising into your channels.”<sup>290</sup> Roku additionally instructs and encourages its customers, partners, and other third parties to use the Roku Infringing Products in a manner that infringes at least one claim of each of the Patents-in-Suit by instructing and encouraging its customer partners, and other third parties to use the Roku Infringing Products to make payments using Roku’s payment platform.<sup>291</sup> The Roku payment platform “provides ... an end-to-end payment process” that, when “integrat[ed] in[to] a channel, ... can provide simple, streamlined workflows that enable customers to purchase and access content with minimal interaction.”<sup>292</sup> “Once customers add a method of payment to their Roku customer account, they can subscribe to channels, rent movies, and purchase sporting events and

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<sup>289</sup> <https://developer.roku.com/docs/developer-program/getting-started/roku-dev-prog.md>.

<sup>290</sup> <https://developer.roku.com/docs/developer-program/advertising/roku-advertising-framework.md>.

<sup>291</sup> *See, e.g.*, <https://developer.roku.com/docs/developer-program/roku-pay/how-roku-pay-works.md>

<sup>292</sup> *Id.*

pay-per-views all directly on-device with just a few key presses from their Roku remote control.”<sup>293</sup>

167. Roku further provides information and technical support on its website (*e.g.*, [www.developer.roku.com](http://www.developer.roku.com)) that instructs and encourages customers, end-users, partners, and third parties on how to use the Roku Infringing Products, and thereby induces and contributes to direct infringement by its customers, end-users, partners, and third parties.

168. In each case, the information and materials provided by Roku contain detailed descriptions and instructions for using and implementing the functionality claimed in at least Claim 1 of the ’584 Patent including, at least, that Roku requires that developers “develop each of [their] Applications in accordance with all Developer Policies, utilizing either (a) Direct Publisher ..., or (b) the [Roku] SDK....”<sup>294</sup>

169. Roku requires developers to “submit [their] Application[s] to Roku for Roku’s review and approval (at Roku’s sole discretion) prior to Roku publishing (or republishing) [their] Application[s].”<sup>295</sup> Roku further requires that developers “not hide, misrepresent or obscure any features, content, services or functionality in [their] Application[s] from Roku’s review, or otherwise hinder Roku from being able to fully review [their] Application[s],” and “cooperate with Roku in its review process and provide information and materials requested by Roku to enable Roku to fully review [their] Application[s].”<sup>296</sup>

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<sup>293</sup> *Id.*

<sup>294</sup> <https://docs.roku.com/published/developerdistribution/en/us>, at ¶ 9.1

<sup>295</sup> *Id.*, at ¶ 9.2.

<sup>296</sup> *Id.*

170. Roku further requires that developers “provide Roku with a sufficient number of test accounts (fully-enabled and, if applicable, fully paid) for [their] Application[s] (including, if applicable, valid log-in credentials) so that Roku can access and review all Content and Developer Services (and functions thereof) made available via [their] Application[s].”<sup>297</sup>

171. Roku further requires that all “Paid Applications must (a) use Roku Pay and not any alternate billing service, (b) refrain from directing end users to use alternative billing services, and (c) refrain from otherwise encouraging end users to purchase access to your Content other than through the Platform.”<sup>298</sup>

172. On information and belief, in order for a developer’s application to be approved by Roku, Roku requires that the developer follow Roku’s guidelines for application development, including using Roku’s “current APIs,” and provides a “Static Analysis tool [to] check[] the structure and syntax of [the] channel’s code for common problems related to certification requirements and list[] any errors that must be resolved before the channel can be scheduled for publishing,” and a “Channel Behavior Analysis tool,” which “launches the channel and checks for state-driven results to verify compliance with various certification criteria.”<sup>299</sup>

173. Roku additionally instructs and encourages its customers, end-users, partners, and third parties to use the Roku Infringing Products in a manner that directly infringes at least Claim 1 of the ’584 Patent, by providing instruction to its customers, end-users, partners, and third parties

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<sup>297</sup> *Id.*, at ¶9.3.

<sup>298</sup> *Id.* at Exhibit A, ¶ 3.1.

<sup>299</sup> <https://developer.roku.com/docs/developer-program/certification/certification.md>

on its website.<sup>300</sup> For example, Roku provides a “Roku Support” website (<https://support.roku.com/>) that includes instruction on a variety of topics, including device setup,<sup>301</sup> Roku Features,<sup>302</sup> and Channels and viewing.<sup>303</sup>

### **PRAYER FOR RELIEF**

WHEREFORE, Plaintiff prays for judgment on the complaint as follows:

a. Judgment in favor of IOENGINE and against Defendant for infringement, either literally and/or under the doctrine of equivalents, of one or more claims of each of the Patents-in-Suit;

b. Entry of a permanent injunction enjoining Defendant and its affiliated entities, officers, agents, servants, employees, and those persons in active concert or participation with them who receive actual notice thereof, from directly or indirectly infringing, inducing the infringement of, or contributing to the infringement of each of the Patents-in-Suit;

c. An award to IOENGINE of compensatory damages arising out of Defendant’s infringement, including damages for any continuing post-verdict infringement up until entry of the final judgment and increased damages for Defendant’s willful infringement, together with pre-judgment and post-judgment interest thereon;

d. An award to IOENGINE of costs, interest, and reasonable attorneys’ fees incurred herein;

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<sup>300</sup> See, e.g., <https://www.roku.com/how-it-works>.

<sup>301</sup> See, e.g., <https://support.roku.com/article/208754888> (“How do I set up my Roku® streaming player or Streaming Stick® (any model)?”); <https://support.roku.com/category/115001360548> (“Roku Setup”).

<sup>302</sup> See, e.g., <https://support.roku.com/category/200889378>.

<sup>303</sup> See, e.g., <https://support.roku.com/category/4403796545175>.



e. An accounting for future sales and an award to IOENGINE of compensatory damages arising out of Defendant's ongoing infringement and increased damages for Defendant's willful ongoing infringement; and

f. Such other and further relief as the Court may deem just and appropriate.

**DEMAND FOR JURY TRIAL**

174. In accordance with Rule 38 of the Federal Rules of Civil Procedure, Plaintiff demands a trial by jury on all issues so triable.

Dated: December 14, 2021

**DECHERT, LLP**

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